State Clearinghouse # 2019059010

PG&E McCloud Pit Hydroelectric Project Relicensing (FERC Project No. 2106)

State Water Resources Control Board Water Quality Certification—Draft Subsequent Environmental Impact Report

April 2026

PG&E MCCLOUD-PIT HYDROELECTRIC PROJECT RELICENSING (FERC PROJECT NO. 2106)

State Water Resources Control Board Water Quality Certification—Draft Subsequent Environmental Impact Report

State Clearinghouse No. 2019059010

[April 2026]

Prepared for:

State Water Resources Control Board—
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Prepared by:

Stantec Consulting Services Inc.
3301 C Street, Suite 1900
Sacramento, CA 95816
www.stantec.com

Cover Photo Credit:

Nor Cal Fish Reports, 2020

Table of Contents

1 Executive Summary x

1.1 Project Overview x
1.2 Proposed Project Objectives x
1.3 Proposed Project Impacts and Mitigation Measures xi
1.4 Summary of Proposed Project Impacts xi
1.4.1 Biological Resources xv
1.4.2 Hydrology and Water Quality xv
1.4.3 Tribal Cultural Resources xv
1.4.4 Recreation xvi
1.5 Proposed Project Alternatives xvi
1.6 Potential Areas of Controversy/Issues to be Resolved xvi
1.7 How to Comment on this Draft SEIR xvi

2 Introduction 2-1

2.1 Background 2-1
2.1.1 Petition for Reconsideration 2-1
2.1.2 Subsequent Environmental Impact Report 2-1
2.2 CEQA Baseline 2-2
2.3 Notice of Preparation 2-3
2.4 SEIR Organization 2-4
2.5 Use of FERC EIS 2-5
2.6 Agency Participation and Application 2-5
2.7 Public Review Process 2-5
2.7.1 Public Review 2-5
2.7.2 Final SEIR 2-6
2.8 Project Background 2-8

3 Project Description and Description of Alternatives 3-1

3.1 Existing Hydroelectric Project Facilities 3-1
3.1.1 James B. Black Development 3-1
3.1.2 Pit 6 Development 3-3
3.1.3 Pit 7 Development 3-3
3.1.4 Routine Operations and Maintenance 3-4
3.1.5 Existing Recreation Facilities 3-8
3.1.6 Existing Recreation Facilities Routine Operations and Maintenance 3-13
3.1.7 Project Safety 3-13
3.1.8 Previously Adopted Environmental Components 3-14

3.2 Proposed Project 3-27
3.2.1 Powerhouses 3-28
3.2.2 Project Purpose and Objectives 3-29
3.2.3 Proposed Project Boundary 3-29
3.2.4 Proposed Recreation Facilities 3-30
3.2.5 Proposed Recreation Facility Operations and Maintenance 3-38
3.2.6 Proposed Minimum Instream Flows 3-38
3.2.7 Proposed Project Schedule 3-40
3.2.8 Alternatives Evaluated in this SEIR 3-41

4 Environmental Setting, Impacts, and Mitigation Measures 4-1

4.1 Introduction 4-1
4.2 Resource Areas Not Addressed in this SEIR 4-1
4.3 Evaluation of Environmental Impacts 4-2
4.4 Biological Resources 4-2
4.4.1 Environmental Setting 4-2
4.4.2 Regulatory Setting 4-17
4.4.3 Impacts and Mitigation Measures 4-23
4.5 Hydrology and Water Quality 4-40
4.5.1 Environmental Setting 4-40
4.5.2 Regulatory Setting 4-41
4.5.3 Impacts and Mitigation Measures 4-44
4.6 Tribal Cultural Resources 4-60
4.6.1 Environmental and Cultural Setting 4-61
4.6.2 Regulatory Setting 4-73
4.6.3 Impacts and Mitigation Measures 4-79
4.7 Recreation 4-91
4.7.1 Environmental Setting 4-91
4.7.2 Regulatory Setting 4-95
4.7.3 Impacts 4-96

5 Alternatives 5-1

5.1 Alternatives Analysis 5-1
5.1.1 Alternatives Analysis and Screening Process 5-1
5.1.2 Alternatives Considered but Eliminated 5-1
5.1.3 Alternatives Carried Forward 5-2
5.2 Environmentally Superior Alternative 5-5
5.3 No Project Alternative 5-6
5.3.1 Biological Resources 5-6
5.3.2 Hydrology and Water Quality 5-7

5.3.3 Tribal Cultural Resources 5-7
5.3.4 Recreation 5-7
5.4 Alternative 1 – Whitewater Boater Flows 5-8
5.4.1 Biological Resources 5-8
5.4.2 Hydrology and Water Quality 5-10
5.4.3 Tribal Cultural Resources 5-10
5.4.4 Recreation 5-11
5.5 Alternative 2 – Salmon Flows 5-12
5.5.1 Biological Resources 5-13
5.5.2 Hydrology and Water Quality 5-15
5.5.3 Tribal Cultural Resources 5-16
5.5.4 Recreation 5-17

6 Other CEQA Statutory Sections 6-1

6.1 Introduction 6-1
6.2 Impacts Found Not to be Significant 6-1
6.3 Irreversible Impacts 6-2
6.4 Significant and Unavoidable Impacts 6-3
6.5 Cumulative Impacts 6-3
6.5.1 Introduction 6-3
6.5.2 Approach to Analysis 6-4
6.5.3 Analysis 6-5

7 List of Preparers 7-1

7.1 Lead Agency / Project Team 7-1
7.2 Technical Preparers 7-1

8 References 8-1

List of Appendices

Appendix A: Petitions for Reconsideration
Appendix B: Notice of Preparation, Agency Consultation Correspondence, Comment Letters Received, and Responses to Comments
Appendix C: Section 401 Water Quality Certification
Appendix D: Biological Resources Species Tables
Appendix E: Tribal Cultural Resource Memorandum and Analysis

List of Tables

Table 1-1. Summary of Proposed Project Impacts and Proposed Project Mitigation Measures. xi

Table 2-1. Overview of Potential Future Permit Approval and Consultation Requirements for the PG&E McCloud-Pit Hydroelectric Project Relicensing 2-6

Table 3-1. Routine Operations and Maintenance Practices for Existing Hydroelectric Project Infrastructure 3-5

Table 3-2. Hydroelectric Project Gages 3-8

Table 3-3. Proposed Project Recreation Facilities: Construction Personnel, Duration, Equipment List, and Disturbed Acreage 3-30

Table 3-4. Proposed Project Minimum Instream Flow from McCloud Dam into the McCloud River 3-38

Table 3-5. Proposed Project Minimum Instream Flows from Iron Canyon Dam into Iron Canyon Creek (cfs).... 3-40

Table 4-1. Water temperature monitoring stations, location, and river mile.... 4-6

Table 4-2. Fish and Aquatic Species Identified in Proposed Project Reservoirs and Stream Reaches During Relicensing Technical Studies and other Studies, including recently reintroduced spring-run Chinook salmon eggs/juveniles.... 4-13

Table 4-3. Developed Recreation Sites Inventoried in 2007 4-92

Table 4-4. Dispersed Recreation Sites Inventoried in 2007 4-92

Table 4-5. Recreation Areas with Proposed Enhancements 4-93

Table 5-1. Comparison of Proposed Project Impacts and Proposed Project Alternatives Impacts 5-2

Table 5-2. Minimum Instream Flows for Alterntative 2 (July through September).... 5-12

List of Figures

Figure 2-1. Hydroelectric Project Location.... 2-9

Figure 3-1. Recreation Facilities in the Vicinity of McCloud Reservoir.... 3-10

Figure 3-2. Recreation Facilities in the Vicinity of Iron Canyon Reservoir 3-12

Figure 3-3. Large Woody Debris Sites 3-21

Figure 3-4. Recreation Facilities in the Vicinity of Pit 7 Reservoir.... 3-37

Figure 4-1. Comparison of daily average water temperature at the McCloud River monitoring stations above (top) and below (bottom) Squaw Valley Creek, 2008. 4-6

Figure 4-2. Lower McCloud River water temperature simulations for August with normal hydrology (50% exceedance) and normal meteorology (50% exceedance) (top) and August with dry hydrology (75% exceedance) and warm meterology (25% exceedance).... 4-7

Figure 4-3. Multimetric index (MMI) values for the Proposed Project sites (reference sites identified with an asterisk), historical data from the Nature Conservancy's McCloud River Preserve, and historical data from the Pit River (MR = McCloud

River sites, IC = Iron Creek sites, SC = Squaw Valley Creek, CC = Cedar Salt Log Creek) (Source Nevares and Orr 2009, Figure 2). 4-8

Figure 4-4. September change in McCloud River length in miles (black) and percent (blue) of habitat below 12°C due to the Proposed Project minimum flows (1974-2006). 4-25

Figure 4-5. McCloud River September water temperature at RM 0.33 (at the confluence with Shasta Lake) under Exisiting Conditions and the Proposed Project. 4-26

Figure 4-6. Historical McCloud River turbidity and flow at Kerry Landreth Preserve, 1.6 miles downstream of Ah-Di-Na (top) and USGS 11367800 – McCloud R A Ah-Di-Na NR McCloud CA and USGS Gage 11368000 McCloud Ri Ab Shasta Lake, CA (bottom) (2010-2024) 4-50

Figure 4-7. Calculated inflow turbidity and measured outflow turbidity below McCloud Dam based on Nevares and Sargraves 2009 Figures 6, 10, and 49 and CDEC and USGS flow data (July 1 – Sep 2008) logarithmic scale (top) and linear scale (bottom). On average inflow turbidity is less than outflow turbidity (6.85 versus 14.06 NTU) and has lower peaks than the outflow turbidity. 4-51

Figure 4-8. Historical McCloud River water temperature (Kerry Landreth Preserve, 1.6 miles downstream of Ah-Di-Na) and flow (USGS 11367800 – McCloud R A Ah-Di-Na NR McCloud CA) (2010-2024) 4-54

Figure 4-9. WWT Traditional Cultural Landscape TCR Boundary in relation to Project APE and SEIR AOA. 4-67

Acronyms / Abbreviations

ac-ft	acre-feet
AFRP	Anadromous Fish Restoration Program
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
AQMD	Air Quality Management District
BE	Biological Evaluation
BMI	benthic macroinvertebrate
BMP	Best Management Practice
CAISO	California Independent System Operators
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Ranking
CSC	California Species of Special Concern
CV	Central Valley
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
DOC	California Department of Conservation
DPS	Distinct Population Segment
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement

ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FOP	Friends of the Pleistocene
FPA	Federal Power Act
FYLF	foothill yellow-legged frog
GHG	greenhouse gas
gpd	gallons per day
Guidelines	USFWS National Bald Eagle Management Guidelines
GWh	gigawatt hours
GWh/yr	gigawatt hours per year
hp	horsepower
IPaC	Information for Planning and Conservation
IS	Initial Study
IS/ND	Initial Study/Negative Declaration
JSCS	Juvenile Salmonid Collection System
kV	kilovolt
LOP	limited operating period
LWD	Large woody debris
mg/kg	milligram per kilogram (mg/kg
MIF	minimum instream flow
MOU	memorandum of understanding
MSFCMA	Magnuson-Stevens Conservation and Management Act
msl	mean sea level
MVA	megavolt-ampere
MW	megawatts
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NFS	National Forest Service
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service

NSVPA	Northern Sacramento Valley Planning Area
NTU	Nephelometric Turbidity Unit
NVUM	National Visitor Use Monitoring
PCA	Pest Control Adviser
PG&E	Pacific Gas and Electric Company
PHABSIM	Physical Habitat Simulation
Reclamation	US Bureau of Reclamation (Reclamation
RCAP	Regional Climate Action Plan
RM	river mile
RMO	Road Management Objective
RO	runoff
ROS	Recreation Opportunity Spectrum
RPA	Reasonable and Prudent Alternative
RSI	remote site incubators
RST	rotary screw traps
RWQCB	Regional Water Quality Control Board
SEIR	Subsequent Environmental Impact Report
SHPO	California State Historic Preservation Officer
SMARA	Surface Mining and Reclamation Act of 1975
SR	Sacramento River
STNF	Shasta-Trinity National Forest
SVAQEEP	Sacramento Valley Air Quality Engineering and Enforcement Professionals
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Recources Control Board
TCP	Traditional Cultural Properties
TMDL	total Maximum Daily Load
TSS	total suspended solids
USACE	United States Army Corps of Engineers
USEIA	United States Energy Information Administration
USEPA	United States Environmental Protection Agency
USFS	United States Department of Agriculture – Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VELB	valley elderberry longhorn beetle

WRAP	Winter-run Action Plan
WSP	Wildfire Safety Plan
WWT	Winnemem Wintu Tribe

1 Executive Summary

This Draft Subsequent Environmental Impact Report (SEIR) evaluates potential environmental effects associated with proposed operational modifications to the Pacific Gas and Electric (PG&E) McCloud-Pit Hydroelectric Project (Proposed Project; Federal Energy Regulatory Commission [FERC] Project No. 2106). The SEIR has been prepared in accordance with the California Environmental Quality Act (CEQA) to disclose potential environmental impacts, identify feasible mitigation measures and alternatives, and inform public agency decision-making related to the State Water Resources Control Board's (State Water Board) water quality certification for the Proposed Project. The analysis builds upon the previously adopted environmental documentation and focuses on new information and project changes related to instream flow requirements, whitewater recreation, and the protection of biological, hydrologic, tribal cultural, and recreational resources.

1.1 PROJECT OVERVIEW

The PG&E McCloud-Pit Hydroelectric Project (Hydroelectric Project; FERC Project No. 2106) is an existing hydroelectric generation system located in Shasta and Siskiyou Counties, California, within the McCloud and Pit River watersheds. The Hydroelectric Project includes multiple dams, reservoirs, powerhouses, water conveyance facilities, transmission infrastructure, and associated recreation facilities. Construction of Project facilities and commencement of Project operations occurred in the 1960s. Hydroelectric Project operations are governed by FERC licensing requirements, United States Forest Service (USFS) Section 4(e) conditions, and water quality certification conditions issued by the State Water Board.

The Proposed Project evaluated in this Draft SEIR consists of continued operation of the existing Hydroelectric Project under a new FERC license, with operational modifications and resource protection measures intended to protect water quality and beneficial uses. This Draft SEIR evaluates changed circumstances associated with the relicensing of the existing Hydroelectric Project. The SEIR does not reevaluate the full scope of the existing Hydroelectric Project. Key components include revised minimum instream flow requirements below McCloud Dam and Iron Canyon Dam, implementation of management and monitoring plans, construction and improvement of recreation facilities, and consideration of whitewater boating flows required under Water Quality Certification Condition 10 (under Alternative 1).

This Draft SEIR focuses on new information and changed circumstances, including the reintroduction of winter-run Chinook salmon to the McCloud River and evaluation of higher flow releases for whitewater recreation. The analysis evaluates whether these changes would result in new or more severe environmental impacts beyond those analyzed in previously adopted environmental documents and identifies mitigation measures and alternatives, as required under CEQA.

1.2 PROPOSED PROJECT OBJECTIVES

The objectives of the Proposed Project, as evaluated in this SEIR, are to:

- Generate renewable hydroelectric energy in support of California's renewable energy goals.
- Operate the Project in compliance with applicable water quality standards and regulatory requirements.

- Implement operational measures to improve the baseline environmental condition, with particular emphasis on biological resources, hydrology and water quality, tribal cultural resources, and recreation.

1.3 PROPOSED PROJECT IMPACTS AND MITIGATION MEASURES

The SEIR evaluates potential impacts associated with the changes that would result from implementation of the Proposed Project and identifies mitigation measures where necessary. Environmental topics addressed include biological resources, hydrology and water quality, tribal cultural resources, and recreation. Where impacts were identified, mitigation measures are incorporated to reduce impacts to the extent feasible. Mitigation measures focus on protecting aquatic habitat, maintaining water quality standards, preserving tribal cultural resource values, and minimizing effects of recreational uses.

Impact-reducing measures undertaken in response to permit or license conditions (i.e., Water Quality Certification Conditions, U.S. Forest Service mandatory conditions under Section 4(e) of the Federal Power Act) are not considered mitigation measures under CEQA but are treated as part of the Proposed Project. These conditions are referred to as Environmental Components throughout this document and are summarized in Section 3.1.8. Continued Hydroelectric Project operations without implementation of the Environmental Components is the No Project Alternative and is analyzed in Chapter 5.

1.4 SUMMARY OF PROPOSED PROJECT IMPACTS

This Draft SEIR evaluates the potential environmental effects associated with proposed operational modifications to the Hydroelectric Project and determines whether those changes would result in new or more severe impacts than those disclosed in the previously adopted environmental studies for the Proposed Project. The SEIR focuses on resource areas, specifically biological resources, hydrology and water quality, tribal cultural resources, and recreation (Table 1-1) that could be affected by changes in instream flows, ramping rates, water temperature management, and associated operational measures.

Table 1-1. Summary of Proposed Project Impacts and Proposed Project Mitigation Measures.

Environmental Resource / CEQA Impact Criterion: ***Would the Proposed Project…***	Mitigation	Significance After Mitigation
Biological Resources		
IMPACT BIO-1: Adversely affect special status species or their habitats	**Mitigation Measure BIO-1: Whitewater Flow Seasonality.** Whitewater boating flows below McCloud Dam are restricted to winter/spring, initiated before FYLF breeding, with monitoring to ensure breeding timing and guide future flow releases.	LTS
IMPACT BIO-2: Harm riparian or sensitive natural communities	None required.	LTS
IMPACT BIO-3: Adversely affect federally protected wetlands	None required.	LTS
IMPACT BIO-4: Disrupt movement corridors for native fish or wildlife	None required.	LTS
IMPACT BIO-5: Conflict with policies protecting biological resources	None required.	LTS

Environmental Resource / CEQA Impact Criterion: *Would the Proposed Project…*	Mitigation	Significance After Mitigation
IMPACT BIO-6: Conflict with adopted habitat conservation plans or similar	None required.	LTS
Hydrology and Water Quality		
IMPACT WATER-1: Violate water quality standards or degrade surface water quality	**MM WATER-1: Long-term Turbidity Control.** PG&E will regularly monitor and manage sediment accumulation in McCloud and Iron Canyon reservoirs to prevent the release of turbidity downstream, in coordination with relevant agencies. **MM WATER-2: Turbidity Measurement and Monitoring.** PG&E will continuously monitor water turbidity and temperature in the McCloud Reservoir and River, develop a numerical model, and take action if project operations cause turbidity issues.	LTS
IMPACT WATER-2: Decrease groundwater supplies or recharge	None required.	LTS
IMPACT WATER-3i: Increase erosion or siltation	None required.	LTS
IMPACT WATER-3ii: Increase surface runoff which contributes to flooding	None required.	LTS
IMPACT WATER-3iii: Exceed the capacity of stormwater drainage systems or increase polluted runoff	None required.	LTS
IMPACT WATER-3iv: Impede or redirect flood flows	None required.	LTS
IMPACT WATER-4: Risk release of pollutants due to project inundation by flood or tsunami	None required.	NI
IMPACT WATER-5: Conflict with a water quality control plan or sustainable groundwater management plan	None required.	LTS

Environmental Resource / CEQA Impact Criterion: *Would the Proposed Project…*	Mitigation	Significance After Mitigation
Tribal Cultural Resources		
IMPACT TCR-1: Alter the baseline condition of water quality in a manner that would substantially and adversely change TCRs, including by substantially and adversely changing character-defining features or contributing elements of the WWT Traditional Cultural Landscape TCR	**MM TRIBAL-1: HPMP.** PG&E shall amend and update the Historic Properties Management Plan, in consultation with the Wintu of the Winnemem Wintu Tribe, to incorporate the Tribe's Traditional Cultural Landscape, ethnobiological resources, emergency protocols, inadvertent discovery procedures, and protection of Nur (Chinook salmon) habitat, with dispute resolution documented and elevated to appropriate agencies if consensus cannot be reached. **MM TRIBAL-2: Information Sharing.** PG&E shall establish Tribal points of contact and provide timely notification and responses regarding flow, turbidity exceedances, and anticipated releases from McCloud Dam to ensure early awareness of conditions that could affect Tribal Cultural Resources. **MM TRIBAL-3: Tribal Consultation for Management Plans.** PG&E shall consult with affiliated Tribes during the development and implementation of required management plans to incorporate traditional knowledge, identify sensitive areas, avoid or minimize disturbance, and protect Tribal Cultural Resources prior to agency submittal. **MM TRIBAL-4: Construction and Maintenance.** PG&E shall comply with the State Water Board's Construction General Permit and implement approved site-specific water quality monitoring and protection measures before initiating construction or maintenance activities. **MM WATER-1: Long-term Turbidity Control.** **MM WATER-2: Turbidity Measurement and Monitoring.**	Turbidity's Effect on Aquatic Species: LTS Turbidity's Effect on Ceremonies: SU Temperature: SU Hazardous Materials: LTS
IMPACT TCR-2: Alter the baseline condition of McCloud River flows in a manner that would substantially and adversely change TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-2: Information Sharing.** **MM TRIBAL-3: Tribal Consultation for Management Plans.** **MM TRIBAL-4: Construction and Maintenance.** **MM BIO-1: Whitewater Flow Seasonality** **MM WATER-1: Long-term Turbidity Control.**	Aquatic Species: SU Ceremonies: SU
IMPACT TCR-3: Through physical disturbance (instream and upland locations), alter baseline conditions in a manner that would substantially and adversely change TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-3: Tribal Consultation for Management Plans.** **MM TRIBAL-4: Construction and Maintenance.**	LTS

Environmental Resource / CEQA Impact Criterion: *Would the Proposed Project…*	Mitigation	Significance After Mitigation
IMPACT TCR-4: Alter the baseline condition through the release or application of hazardous materials that substantially and adversely change TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-3: Tribal Consultation for Management Plans.** **MM TRIBAL-4: Construction and Maintenance.**	LTS
IMPACT TCR-5: Alter baseline conditions through the spread or introduction of invasive species in Project area that could substantially and adversely change TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-3: Tribal Consultation for Management Plans.** **MM TRIBAL-4: Construction and Maintenance.**	LTS
IMPACT TCR-6: Alter baseline aesthetic conditions in a manner that substantially and adversely changes TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-3: Tribal Consultation for Management Plans.**	LTS
IMPACT TCR-7: Change the baseline condition of terrestrial species habitats in a manner that substantially and adversely changes TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-2: Information Sharing.** **MM TRIBAL-3: Tribal Consultation for Management Plans.** **MM TRIBAL-4: Construction and Maintenance.**	LTS
IMPACT TCR-8: Change the baseline condition of aquatic species habitats in a manner that substantially and adversely changes TCRs	**MM TRIBAL-1: HPMP.** **MM TRIBAL-2: Information Sharing.** **MM TRIBAL-3: Tribal Consultation for Management Plans.** **MM TRIBAL-4: Construction and Maintenance.** **MM BIO-1: Whitewater Flow Seasonality** **MM WATER-1: Long-term Turbidity Control.** **MM WATER-2: Turbidity Measurement and Monitoring.**	SU
Recreation		
IMPACT REC-1: Increase the use of recreational facilities to the point where they deteriorate	None required.	LTS
IMPACT REC-2: Require construction or expansion of recreation facilities	None required.	LTS

Legend:

IG = Impacts Greater Compared to the Proposed Project

IR = Impacts Reduced Compared to Proposed Project

IS = Impacts Similar to Proposed Project

LTS = Less than Significant

LTSM = Less than Significant with Mitigation Incorporated

NI = No Impact

SU = Significant and Unavoidable

1.4.1 Biological Resources

The SEIR evaluates potential effects on aquatic and terrestrial biological resources, including fish, amphibians, riparian vegetation, and wildlife. Changes in flow magnitude, timing, and ramping rates have the potential to affect aquatic habitat availability, species movement, and sensitive life stages. The analysis concludes that, while there is potential for significant impacts to aquatic biological resources, with implementation of Mitigation Measure BIO-1, impacts would be less than significant. Similarly, significant impacts to terrestrial biological resources that could potentially result from proposed operational changes would be less than significant with implementation of mitigation measures, including measures requiring Tribal involvement in development and implementation of management plans.

1.4.2 Hydrology and Water Quality

Potential impacts to hydrology and water quality were evaluated with respect to changes in instream flow conditions, sediment transport, water temperature, and compliance with applicable water quality standards. The SEIR finds that the Proposed Project could alter flow patterns within the Project area; however, adherence to minimum instream flow requirements, ramping rate limitations, and temperature management thresholds would avoid substantial degradation of water quality. While the possibility of significant impacts related to turbidity cannot be ruled out due to uncertain data, with implementation of two mitigation measures requiring monitoring and reporting and water quality protection measures, impacts to hydrology and water quality would be less than significant.

1.4.3 Tribal Cultural Resources

The SEIR evaluates whether changes from the Proposed Project modifications could result in adverse effects on tribal cultural resources (TCRs) associated with the McCloud River Watershed. Potential impacts to TCRs are associated with changes in water quality, flow timing and magnitude, physical disturbance from construction and maintenance activities, use of hazardous materials, spread of invasive species, and changes to visual character and noise. Of particular concern are effects on character-defining features of the Winnemem Wintu Tribe (WWT) Traditional Cultural Landscape TCR documented and evaluated as part of the State Water Board's AB 52 consultations with the Tribe (see Section 4.6). Character-defining features of the TCR include but are not limited to the McCloud River, culturally significant aquatic species such as winter-run Chinook salmon (*Nur*), ceremonies and ceremonial locations, ethnobiological resources, archaeological sites, and Tribal access to and use of the river for cultural, spiritual, and subsistence practices. Alterations in turbidity, temperature, and flow conditions could affect *Nur* and other aquatic resources integral to the integrity and significance of the TCR and the Tribe's ability to conduct ceremonies and maintain cultural relationships with the McCloud River Watershed and their Traditional Cultural Landscape..

With implementation of mitigation measures, including updates to PG&E's Historic Properties Management Plan (HPMP), continued input from Tribes, including Tribal involvement in development and implementation of management plans, compliance with water quality mitigation measures, and construction controls, most impacts to TCRs and the WWT Traditional Cultural Landscape TCR would be reduced. However, even though mitigation would lessen impacts, there are significant and unavoidable impacts to the character-defining features that make up the WWT Traditional Cultural Landscape TCR from increased turbidity and changed flows. These impacts would remain significant and unavoidable after mitigation is applied.

1.4.4 Recreation

Recreational resources evaluated in the SEIR include fishing, boating, and other river-dependent recreational activities. Changes in flow timing and magnitude could affect recreational opportunities; however, the SEIR finds that the Proposed Project would not substantially degrade recreational use. Impacts to recreation would be less than significant due to temporary construction effects and long-term maintenance or enhancement of recreational access and use opportunities. In addition, with implementation of existing flow management measures and coordination with recreational stakeholders, impacts to recreation would be less than significant.

1.5 PROPOSED PROJECT ALTERNATIVES

Consistent with CEQA requirements, the SEIR evaluates a range of alternatives in Chapter 5, including the No Project Alternative and operational alternatives that modify instream flows, ramping rates, and water temperature management. These alternatives are summarized from Chapter 3 of the SEIR and are intended to reduce potential environmental impacts while meeting Proposed Project objectives to the extent feasible. Each alternative is evaluated for its environmental effects and its ability to achieve Proposed Project objectives. The SEIR identifies the Environmentally Superior Alternative in accordance with CEQA Guidelines.

1.6 POTENTIAL AREAS OF CONTROVERSY/ISSUES TO BE RESOLVED

Issues addressed in this SEIR include potential effects of operational changes on aquatic species and habitats, water temperature and flow conditions, TCRs associated with riverine settings, and recreational opportunities. These issues were identified through agency consultation and public input and are analyzed in detail within the SEIR.

1.7 HOW TO COMMENT ON THIS DRAFT SEIR

The Draft SEIR is being circulated for public review and comment in accordance with CEQA. Interested agencies, tribes, and members of the public are encouraged to review the document and provide written comments during the public review period. Comments should focus on the adequacy of the environmental analysis, the identification of impacts, the effectiveness of mitigation measures, and the evaluation of alternatives. All timely comments received will be considered and responded to in the Final SEIR.

The comment period for the Draft EIR is from the date of this notice until May 22, 2026. **Comments on the Draft SEIR must be received by 12:00 p.m. on May 22, 2026**, and can be submitted electronically or by mail as follows:

Email (preferred):
WR401Program@waterboards.ca.gov

or

Mail:
Ms. Savannah Downey
State Water Resources Control Board
Division of Water Rights – Water Quality Certification Program
P.O. Box 2000
Sacramento, CA 95812-2000

The Draft SEIR and associated appendices, along with additional information regarding the State Water Board's certification process (including the Draft and Final IS/ND) are available on the Proposed Project webpage at:
https://waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/mccloudpit_ferc2106.html

Document Availability

If you cannot access the documents online, you can review hardcopies of the Draft SEIR and associated appendices at the following locations. Please note the days the locations are open are provided for convenience; locations may be closed on the indicated days for holidays or other reasons.

State Water Resources Control Board
1001 I Street
2nd Floor, Room 2-114
Sacramento, CA 95814
(916) 341-5300
Open Monday to Friday
9:00 a.m. – 4:30 p.m.
Appointment preferred. Schedule an appointment by emailing:
dwr@waterboards.ca.gov

Redding Library
1100 Parkview Avenue
Redding, CA 96001
(530) 245-7250
Open every day.

McCloud Library
300 E. Columbero Drive
McCloud, CA 96057
(530) 964-2169
Open Monday, Wednesday, and Friday
12:00 p.m. – 4:00 p.m.

Public Comment Meeting

On May 6, 2026, State Water Board staff will host an online public forum to receive oral comments on the Draft SEIR as follows:

May 6, 2026
Starting at 3:30 p.m.
Registration Link: https://waterboards.zoom.us/meeting/register/s7UKSTQiT-a14Hyxoc5smA
The forum will conclude after all interested persons have provided their comments.

You must register to attend the virtual meeting. Once you register, you will receive an email with a meeting invite.

2 Introduction

2.1 BACKGROUND

FERC released a final Environmental Impact Study (FERC EIS) for the Proposed Project in February 2011. The State Water Board (SWB) issued a California Environmental Quality Act (CEQA) Initial Study/Negative Declaration (IS/ND) (State Clearinghouse No. 2019059010) and water quality certification (certification) for the relicensing of Pacific Gas and Electric Company's (PG&E) McCloud-Pit Hydroelectric Project (Proposed Project), Federal Regulatory Commission (FERC) Project No. 2106, on November 8, 2019. The intent of the certification conditions is to ensure that the Proposed Project will protect water quality and beneficial uses in the Proposed Project area, and include requirements for minimum instream flows, ramping rates, biological resource and water quality monitoring, large woody material management, erosion and sediment management, gravel augmentation, and whitewater recreation. In response to approval of the IS/ND and certification, PG&E, the Winnemem Wintu Tribe (WWT), and North Coast Rivers Alliance (NCRA) filed petitions for reconsideration, as described below.

2.1.1 Petition for Reconsideration

On December 6, 2019, PG&E filed a Petition for Reconsideration of the certification (see Appendix A). The petition filed by PG&E stated there were conflicts between certification conditions and U.S. Forest Service (USFS) 4(e) conditions related to flow requirements, ramping rates, whitewater flows, whitewater access, and reintroduction of anadromous fish. On December 6, 2019, the WWT and NCRA filed a joint Petition for Reconsideration of the IS/ND, CEQA Findings, and certification (see Appendix A). The joint petition stated that the SWB violated the Public Trust Doctrine because the conditions do not adequately protect public trust resources, including the beneficial uses of salmon and steelhead spawning habitat; cold freshwater habitat on the McCloud River; warm freshwater habitat of the Pit River; spiritual, cultural, and traditional resources of the WWT; and public recreational uses.

In response to the Petitions for Reconsideration, on December 30, 2020 the SWB's Executive Director issued Order WQ 2020-0041-EXEC, directing Board staff to reinitiate tribal consultation to inform whether additional CEQA work is necessary and providing that the two Petitions for Reconsideration remain pending with final action to be taken after consultation and any supplemental CEQA review is complete.

2.1.2 Subsequent Environmental Impact Report

As directed by Order WQ 2020-0041-EXEC, SWB staff contacted the California Native American Tribes affiliated with the geographic area of the Proposed Project to offer consultation regarding. The WWT requested consultation. The consultation meetings have resulted in the development of updated TCRs information. CEQA Guidelines Section 15162 states that a subsequent Environmental Impact Report (SEIR) is not required unless the lead agency determines that there are substantial project changes, changed circumstances, or new information of substantial importance that was not known and could not have been known at the time the prior environmental document was adopted shows that additional environmental review is necessary.

Information gained during the consultation, including information regarding the Winnemem Wintu Traditional Cultural Landscape, that could not have been known prior to completion of the IS/ND due to the short timeline associated with Clean Water Act section 401 water quality certifications and which constitutes new information of substantial importance that would potentially result in identification of significant impacts that were not discussed in the IS/ND. The SWB issued a Notice of Preparation and

scoping meetings for this SEIR on March 10, 2022, and is preparing this SEIR pursuant to CEQA Guidelines Section 15162(b) to analyze impacts to tribal cultural resources, biological resources, hydrology and water quality, and recreation resources.

The Proposed Project evaluated in the 2019 IS/ND—consisting of continued operation of the McCloud-Pit Hydroelectric Project and implementation of associated resource management plans and measures—remains the same. However, since certification of the IS/ND, new information and changed circumstances have arisen, including completion of Tribal consultation, reintroduction of winter-run Chinook salmon to the McCloud River, and consideration of higher flow releases for whitewater recreation. Consistent with CEQA Guidelines Section 15162, this SEIR has been prepared to evaluate whether this new information and these operational modifications would result in new or additional environmental impacts than those disclosed in the IS/ND. The IS/ND and the FERC EIS remain valid and are incorporated by reference to the extent they do not conflict with the analysis and conclusions presented in this SEIR. This Proposed Project Description reflects the same underlying project evaluated in the prior IS/ND, with the SEIR focused on evaluating specific operational changes, a minor project boundary adjustment, and new information relevant to the subsequent CEQA determination.

2.2 CEQA BASELINE

The CEQA baseline is the point or span in time or the set of conditions against which expected future environmental conditions associated with a proposed project are compared. Changes relative to the baseline environmental conditions resulting from the project represent the environmental impacts that must be disclosed under CEQA. Therefore, definition of an appropriate baseline is an integral part of the CEQA process.

The typical baseline for CEQA analysis[1] is the conditions existing when the notice of preparation (NOP) is released for a proposed project. California courts, however, have made clear that a CEQA analysis must "employ a realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely impacts." (*Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 449 (citing *Communities for a Better Environment v. South Coast Air Quality Management* Dist. (2010) 48 Cal.4th 310, 322, 325, 328.) Accordingly, a lead agency has the discretion to select a baseline other than the time of preparation of the NOP for purposes of CEQA analysis if the selection of the baseline is warranted by the circumstances and supported by

[1] Section 15125 of the CEQA Guidelines provide the following guidance for establishing the baseline:
(a) An EIR must include a description of the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives. The purpose of this requirement is to give the public and decision makers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts.

(1) Generally, the lead agency should describe physical environmental conditions as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record.

substantial evidence (*Neighbors for Smart Rail, supra*, at 449 [agency has discretion to decide how existing physical conditions are to be realistically measured, subject to support by substantial evidence]).

The NOP for the Proposed Project was issued on March 10, 2022. Since March 2022, however, due to the collaborative effort of National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), California Department of Water Resources (DWR), California Department of Fish and Wildlife (CDFW), and the Winnemum Wintu Tribe, endangered winter-run Chinook salmon have returned to the to the McCloud River for the first time since the construction of Shasta Dam in the 1940s (NMFS 2024a). These actions were supported by the Central Valley Salmonid Recovery Plan (NOAA Fisheries 2014)[2]. On May 1, 2024, NOAA Fisheries provided the SWB with a letter[3] that describes the collaborative effort, including urgent drought response actions in 2022 that involved the incubation and rearing of winter-run Chinook eggs and fry in the McCloud River watershed, further reintroduction efforts over the summer of 2023, and NOAA Fisheries' issuance of a Final Rule on the "Designation of Nonessential Experimental Populations of Chinook Salmon Upstream of Shasta Dam, Authorization for Release, and Adoption of Limited Protection Regulations Under the Endangered Species Act §10(j) and 4(d)" (88 Fed. Reg. 58511) on August 28, 2023.

Due to these developments the environmental conditions in the vicinity of the Proposed Project that existed in March 2022 no longer represent the actual existing environmental conditions. Relying on a baseline that reflects March 2022 conditions would not give the public and decision makers the most accurate picture practically possible of the Proposed Project 's likely impacts because such a baseline would not include the presence of winter-run Chinook in the McCloud River or acknowledge the designation of the nonessential experimental population and could result in the SEIR understating the environmental impacts of the Proposed Project. Use of a baseline that reflects the actual existing conditions would allow for a more accurate assessment of environmental impacts, including potential impacts related to tribal, biological, and recreational resources.

After considering these circumstances the SWB has determined that the conditions existing at the time NOAA Fisheries sent its May 1, 2024, letter to the SWB best represent the actual existing environmental conditions in the vicinity of the Proposed Project. Accordingly, this SEIR uses 2024 as the baseline year to analyze impacts of the Proposed Project and alternatives.

2.3 NOTICE OF PREPARATION

The SWB issued a Notice of Preparation and Scoping Meetings for a Subsequent Environmental Impact Report (NOP) on March 10, 2022 pursuant to CEQA Guidelines Section 15082 (see Appendix B). The purpose of the NOP was to seek input from trustee agencies, responsible agencies, tribes, and interested persons regarding the scope and content of the environmental information to be included in the SEIR.

The SWB received two comment letters in response to the NOP: Stephan Volker, on behalf of the Winnemem Wintu Tribe and North Coast River Alliance, and Save California Salmon (see Appendix B). The following issues were raised:

- Complete tribal consultation with the Winnemum Wintu Tribe, specifically addressing reintroduction of Chinook salmon to the McCloud River and fish passage.

[2] FERC. 2024. List of Comprehensive Plans: California Central Valley Recovery Plan, July 2014. FERC, April 2024.

- Water quality and biological resource issues as a result of Proposed Project changes, including development of recreation facilities and minimum instream flows.
- Implementation of mitigation and monitoring plans, and protection, mitigation, and enhancement measures, all of which should consider the protection and preservation of tribal lands.

2.4 SEIR ORGANIZATION

This SEIR is organized in the following chapters.

- Chapter 1 – Executive Summary: Provides a concise overview of the Proposed Project, summarizes key impacts and mitigation measures, alternatives, highlights areas of controversy raised by agencies and the public, and addresses unresolved issues.
- Chapter 2 – Introduction: Describes the purpose of the SEIR, offers background information about the Proposed Project, and outlines the environmental review process, including consultation steps and baseline determination.
- Chapter 3 – Project Description: Details the Proposed Project, including its objectives, components, and relevant environmental setting.
- Chapter 4 – Impact Analysis: Presents the environmental analysis, with sections for biological resources, hydrology and water quality, tribal cultural resources, and recreation resources. Identifies Proposed Project impacts and recommended mitigation measures.
- Chapter 5 – Alternatives: Discusses alternatives to the Proposed Project, evaluating their environmental impacts as permitted under CEQA, often at a general level compared to the Proposed Project.
- Chapter 6 – Other CEQA Considerations: Analyzes growth-inducing impacts, cumulative impacts, and significant irreversible and unavoidable environmental changes resulting from the Proposed Project.
- Chapter 7 – Report Preparers: Lists all authors, technical specialists, and key members who contributed to the preparation and review of the SEIR.
- Chapter 8 – References: Provides a comprehensive list of references and sources cited throughout the SEIR.
- Appendix A: Petitions for Reconsideration.
- Appendix B: Notice of Preparation, Agency Consultation Correspondence, Comment Letters Received, and Responses to Comments.
- Appendix C: Section 401 Water Quality Certification.
- Appendix D: Biological Resources Species Tables.

- Appendix E: Tribal Cultural Resource Memorandum and Analysis.

2.5 USE OF FERC EIS

CEQA Guidelines Section 15221 states that when a project requires compliance with both CEQA and NEPA, state agencies should use the EIS or Finding of No Significant Impact (FONSI) rather than preparing an Environmental Impact Report or ND if the EIS or FONSI complies with the provisions of CEQA. This Draft SEIR includes information that is necessary to comply with CEQA for the purposes of the SWB's certification process but was not included in the final EIS. However, consistent with Section 15150 of the CEQA Guidelines, this SEIR incorporates by reference appropriate sections of the final EIS (in addition to the IS/ND) to avoid repetition of information. In addition, since the Proposed Project contains lands owned by the USFS, the relicensing process resulted in the development of USFS staff recommendations and mandatory conditions under Section 4(e) of the Federal Power Act. Mandatory conditions are appropriately included in the Proposed Project that is analyzed in this SEIR; as discussed herein the effects of past Hydroelectric Project operations are part of the environmental baseline for purposes of the environmental analysis, continued operation of the Hydroelectric Project under the status quo (i.e., without implementation of changes to existing operations, including changes associated with implementation of the mandatory conditions) is analyzed as the No Project Alternative pursuant to Section 15126.6(e)(3)(A) of the CEQA Guidelines, and the incremental effects of changes to the baseline associated with the Proposed Project to the effects of other projects, including past Hydroelectric Project operations are analyzed as cumulative impacts pursuant to Section 15130 of the Guidelines. In addition, the SWB's certification may build upon the Forest Serve requirements by including separate terms and conditions that require PG&E to comply with those requirements.

2.6 AGENCY PARTICIPATION AND APPLICATION

Compliance with federal, state, and local regulations, as well as environmental permits, is required for construction and operation of the Proposed Project. PG&E and its contractors will adhere to all applicable requirements. Major federal, state, and local permits, approvals, and consultations identified for the licensing, construction, and operation of the Proposed Project are described in Table 2-1.

2.7 PUBLIC REVIEW PROCESS

2.7.1 Public Review

In accordance with CEQA Guidelines Sections 15087 and 15105, this Draft SEIR is being circulated for a 45-day public review period to all individuals who have requested a copy, to the Office of Planning and Research, to the State Clearinghouse for distribution to appropriate resource agencies, and to the Shasta and Siskiyou County Clerks for posting. The public review period begins April 7, 2026, and will conclude on May 22, 2026. Please send your comments to Savannah Downey, Project Manager, at:

Email (preferred): WR401Program@waterboards.ca.gov
or
Mail: State Water Resources Control Board
Division of Water Rights – Water Quality Certification Program
Attn: Savannah Downey
P.O. Box 2000 Sacramento, CA 95812-2000.

A Notice of Availability has been distributed to the interested parties mailing list identified by FERC.[4] The Notice of Availability provides a summary of the Proposed Project and its potential environmental effects, identifies locations where the document is available for public review, invites interested parties to provide written comments. A copy of the Notice of Availability is attached to this document.

In addition, the SWB provided Notice of Availability by publication, in accordance with Section 15087(a)(1) of the CEQA Guidelines, in the Redding Record Searchlight. Copies of the Notice of Availability and the Draft SEIR are also available at two libraries near the area affected by the Proposed Project: (1) Redding library; and (2) McCloud library.

2.7.2 Final SEIR

Comments on this Draft SEIR received during the review period will be used to prepare a Final SEIR. Comments should be limited to the contents of this Draft SEIR and not on the contents of the previous IS/ND. The SWB will hold a public hearing before certifying the Final SEIR, during which the public and agencies can provide additional comments.

Table 2-1. Overview of Potential Future Permit Approval and Consultation Requirements for the PG&E McCloud-Pit Hydroelectric Project Relicensing

Jurisdiction	Permits, Approvals & Consultations
Federal Agencies	
FERC	FERC issued the final EIS for Hydropower License, McCloud-Pit Hydroelectric Project, FERC Project No. 2106, California. FERC will also review this SEIR for the Proposed Project.
United States Army Corps of Engineers (USACE)	Section 404 of the CWA authorizes the USACE to issue permits, after notice and opportunity for public hearing, for the discharge of dredge or fill material into the waters of the United States and adjacent wetlands. A nationwide 404 permit could be triggered by implementation of some plans incorporated in the Proposed Project, such as the Coarse Sediment Management Plan.
United States Fish and Wildlife Service (USFWS)	The USFWS has jurisdiction over any species listed under the federal Endangered Species Act (ESA). Consultation under Section 7 of the federal ESA with the lead federal agency is required. USFWS determines whether a proposed action is likely to jeopardize the continued existence of, or destroy or adversely modify critical habitat of, federally listed species. Under the Migratory Bird Treaty Act, USFWS has responsibility for protecting nearly all species of birds, their eggs, and nests.
USFS, Shasta-Trinity National Forest	The Hydroelectric Project is located, in part, on USFS lands. USFS permits maybe needed to implement certain Proposed Project components, such as a Special Use Permit, Road Use Permit, and Timber Harvest Agreement.
State Agencies	
State Water Board	Section 401 of the CWA requires that prior to the issuance of a federal license or permit for an activity or activities that may result in a discharge of pollutants into navigable waters, the applicant must first obtain a certification issued by the SWB or the appropriate California Regional Water Quality Control Board. The SWB is the CEQA lead agency for the Proposed Project and is responsible for issuing the SEIR, adopting CEQA findings, and filing an associated Notice of Determination. The Final 401 Water Quality Certification for the Proposed Project is included as Appendix C.

[4] Interested parties mailing list is available at: the Federal Energy Regulatory Commission website, under "Documents & Filings", and under "eService".

Jurisdiction	Permits, Approvals & Consultations
California Office of Historic Preservation	Under Section 106 of the National Historic Preservation Act, consultation is required regarding identification of cultural resources, and preparation of a Memorandum of Agreement for adverse effects on resources list in or eligible for listing on the National Register of Historic Properties and review of the Historic Properties Management Plan.
California Department of Fish and Wildlife (CDFW)	CDFW is a California Trustee Agency (CEQA Guidelines Section 15386) that has jurisdiction over natural resources affected by a project, which are held in trust for the people of the State of California, with regard to the fish and wildlife of the state, designated rare or endangered native plants, and game refuges, ecological reserves, and other areas administered by CDFW. CDFW may also issue a Lake or Streambed Alteration Agreement (California Fish and Game Code sections 1600 - 1616) with conditions to protect resources whenever a bed or bank of a stream, lake, or reservoir is altered. For example, construction of boat ramps below the lake level would require a Lake or Streambed Alteration Agreement issued by CDFW.
Native American Heritage Commission (NAHC)	The NAHC provides protection to Native American burials from vandalism and inadvertent destruction; provides a procedure for the notification of most likely descendants regarding the discovery of Native American human remains and associated grave goods; and brings legal action to prevent severe and irreparable damage to sacred shrines, ceremonial sites, sanctified cemeteries, and places of worship on public property. The NAHC also maintains an inventory of sacred places. Cultural resources are identified in the Proposed Project area and NAHC guidance will help assess and mitigate any impacts to these resources.
California Department of Transportation (Caltrans)	A transportation permit may by required for transport of oversized loads on state highways (this permit is usually obtained by the construction contractor or subcontractors).
Regional Agencies	
Regional Water Quality Control Board (RWQCB)	California RWQCBs issue certifications according to the CWA Section 401 for construction-related disturbance of water quality. The Proposed Project may be subject to the Construction General Permit[a] for stormwater discharges associated with construction activity. These permits would apply to all construction projects that would disturb one or more acres of soil. These permits would require filing a Notice of Intent as well as the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP).
Local Agencies	
Shasta County	Shasta County has jurisdiction over planning, engineering, environmental health, traffic, and roads within the County. For the Proposed Project, Shasta County has specific interest in traffic, safety, and maintenance of road conditions.
Shasta County Air Quality Management District (AQMD)	Under state and federal law, the local AQMD is required to develop a plan for attaining ambient air quality standards. The Northern Sacramento Valley Planning Area (NSVPA) 2015 Triennial Air Quality Attainment Plan (NSVPA 2015) was adopted in Spring 2013. The air quality element of the Shasta County General Plan (County of Shasta 2004) contains control measures aimed at avoiding and reducing emissions of air contaminants into the local environment.

Notes:

[a] *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities*. Water Quality Order No. 2009-0009-DWQ and National Pollutant Discharge Elimination System No. CAS000002, as amended by Order No. 2010-0014-DWQ, Order No. 2012-0006-DWQ, and any amendments thereto.

2.8 PROJECT BACKGROUND

PG&E owns and operates the McCloud-Pit Hydroelectric Project (Hydroelectric Project) located in the McCloud and Pit River drainages of Northern California in Shasta and Siskiyou Counties, California (Figure 1-1). The Proposed Project addressed in this document consists of the continued operation of the Hydroelectric Project, FERC Project No. 2106, pursuant to a new 30- to 50-year FERC license, with modifications as described below.

In its application for a new FERC license, PG&E proposed changes to the Hydroelectric Project including:

- Changes to minimum instream flows (MIFs) in the McCloud River below McCloud Dam, and Iron Canyon Creek below Iron Canyon Dam to protect aquatic resources.
- Implementation of management and monitoring plans to protect aquatic resources.
- Measures to maintain and enhance recreational opportunities, including construction to provide additional recreation facilities.
- The Proposed Project under CEQA also includes:
  - Terms and conditions contained in FERC's final Environmental Impact Statement (EIS), Appendix D, Commission Staff Recommended Conditions and Appendix E (FERC 2011);
  - United States Department of Agriculture – Forest Service (USFS) 4(e) Conditions (USFS 2010a); and
  - Impacts of potential terms and conditions contained in the SWB's certification, with the exception of Condition 10, Whitewater Recreation[5], that are necessary to protect water quality and the beneficial uses of water that are outlined in the Central Valley Regional Water Quality Control Board (CVRWQCB) Water Quality Control Plan for the Sacramento and San Joaquin Rivers Basins (Basin Plan)[6] (CVRWQCB 2018).

The final 401 certification for the Proposed Project is presented in Appendix C and referenced throughout this document.

[5] Whitewater recreation flows in the certification are included in this SEIR as an alternative to the Proposed Project in addition to salmon flows below McCloud Dam.

[6] Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region for the Sacramento River Basin and the San Joaquin River Basin. Fifth Edition. Revised May 2018 (with Approved Amendments).

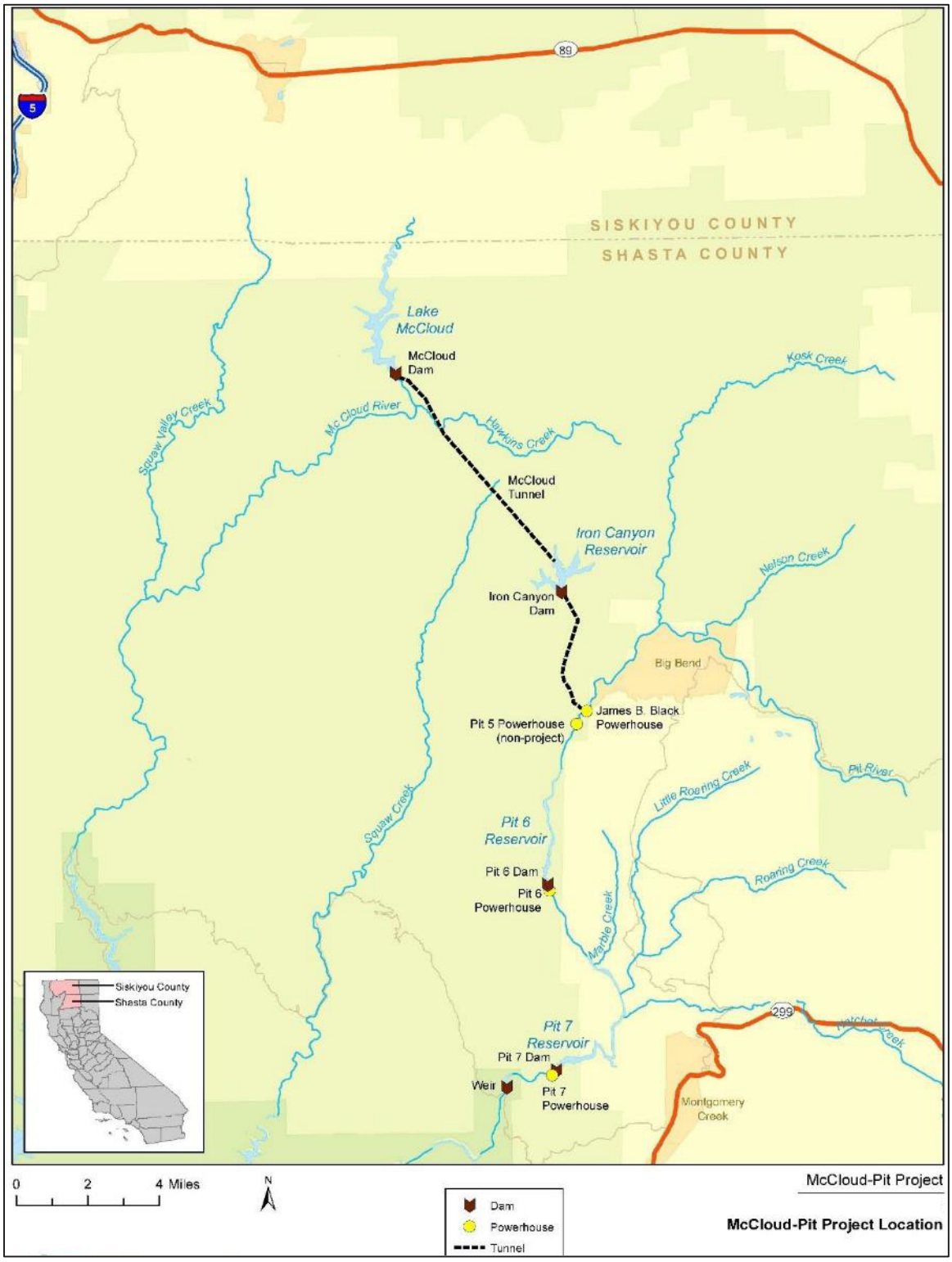


Figure 2-1. Hydroelectric Project Location

The Proposed Project area totals 3,707.6 acres of land, of which: 1,651.4 acres (45 percent) are federally owned and managed by the USFS; 1,239.4 acres (33 percent) are owned by PG&E; and the remaining 816.8 acres are private lands. It consists of three power generating developments (James B. Black, Pit 6, and Pit 7).

These developments collectively include four reservoirs, three powerhouses, five dams, two tunnels, one afterbay, and associated equipment, transmission, and recreation facilities. Installed generation capacity for the Proposed Project is 368-megawatts (MW). The Proposed Project is discussed in more detail in Chapter 1.

The Hydroelectric Project was originally licensed by FERC on August 18, 1961. On July 16, 2009, PG&E filed an application for a new 30- to 50-year license under FERC's Integrated Licensing Process. The original license expired on July 31, 2011; however, the Hydroelectric Project continues to operate under annual license extensions issued by FERC. The 2009 license application included proposed changes to existing operations. The proposed changes include: (a) higher MIF releases to protect aquatic resources in the McCloud River below McCloud Dam, and in Iron Canyon Creek below Iron Creek Dam; (b) measures to protect sensitive species; and (c) measures to maintain and enhance existing recreation opportunities and provide additional recreational facilities (FERC 2011).

Compliance with the National Environmental Policy Act (NEPA) must be demonstrated prior to FERC undertaking a federal action, including issuance of a new license to PG&E for continued operation and maintenance of the Hydroelectric Project. On February 25, 2011, FERC issued the final EIS that analyzed environmental impacts of PG&E's Proposed Project, as well as the comments, conditions, and recommendations that FERC received during the draft EIS public and agency review period.

To receive a new FERC license, PG&E is required to obtain a water quality certification (certification) under Section 401 of the federal Clean Water Act (CWA). The State Water Resources Control Board (SWB) is the agency in California that is responsible for acting on applications for CWA Section 401 certification of hydroelectric projects. The purpose of a certification is to protect the waters of the United States by ensuring waste discharged to waters from a proposed activity meets water quality standards and other appropriate requirements. As part of the FERC licensing process the SWB must issue or deny certification for the Hydroelectric Project. The final 401 certification is presented in Appendix C and referenced throughout this document. Certification conditions will become mandatory conditions of the FERC license for the Proposed Project once the license is issued. The certification conditions reflect those of the USFS 4(e) and FERC conditions relative to water quality and beneficial uses with minor modifications to allow SWB review and approval by the Deputy Director.

Issuance of a certification is a discretionary action that requires the SWB to comply with CEQA. (CEQA Guidelines[7] §§ 15002, subd. (i), 15357.) The SWB is the lead agency under CEQA for the Proposed Project. (Pub. Resources Code, § 21067.) This analysis was prepared to comply with CEQA to assess the environmental effects from changes to the Proposed Project required by the certification issued by the SWB. In a CEQA analysis of an existing hydroelectric project, reauthorization of a project would not likely yield many environmental impacts because the environmental baseline against which impacts are measured for CEQA is typically the existing condition. In contrast, certification requires an analysis of a project's overall effect on water quality, including whether the designated beneficial uses identified in the Basin Plan are adequately protected. The SWB may use a CEQA document prepared during the

[7] The CEQA Guidelines are found at California Code of Regulations, title 14, sections 15000 et seq.

certification process to aid its review of a project's effects on public trust resources. For a discussion on the appropriate CEQA baseline for the Proposed Project refer to Section 3.2.

On November 9, 2018, PG&E submitted an application for water quality certification for the Proposed Project. As described above, the SWB issued an IS/ND and certification for the Proposed Project on November 8, 2019. PG&E (separately) and the WWT and NCRA (jointly) filed petitions for reconsideration of that Board action, and on December 30, 2020, the SWB's Executive Director issued Order WQ 2020-0041-EXEC, which resulted in preparation of this SEIR. Final action on the petitions for reconsideration will occur once this CEQA process is complete.

This SEIR is a focused subsequent environmental review that evaluates new information to determine whether additional or more severe impacts could occur. It does not represent a reevaluation of the entire project, and the prior IS/ND remains valid for resource areas unaffected by these changes.

3 Project Description and Description of Alternatives

3.1 EXISTING HYDROELECTRIC PROJECT FACILITIES

3.1.1 James B. Black Development

3.1.1.1 McCloud Dam and McCloud Reservoir

McCloud Dam is a 241-foot-high, 630-foot-long earth- and rock-filled dam located on the McCloud River that impounds McCloud Reservoir. The McCloud Reservoir has a surface area of 520 acres and a maximum storage capacity of about 31,197 acre-feet (ac-ft). The spillway (elevation 2,696.0 feet above mean sea level [feet msl]) is on the south side of the dam. The reservoir has a normal maximum water surface elevation[8] of 2,680 feet msl. The dam's spillway is equipped with three radial gates measuring 27 feet by 24.5 feet that return spillage flows to the McCloud River. The dam also has a 7-foot diameter diversion/outlet tunnel that runs under the dam to a 24-inch Howell-Bunger valve for releasing instream flows to the McCloud River, as well as an 84-inch diameter butterfly valve for emergency use to control reservoir levels. Controls for the diversion/outlet tunnel are located at the McCloud Tunnel intake structure within McCloud Reservoir.

McCloud Reservoir is located on the McCloud River, which originates at Moosehead Creek, southeast of Mt. Shasta, and flows in a southwesterly direction before entering Shasta Lake. McCloud Reservoir is located approximately 24-river miles upstream from Shasta Lake. From McCloud Reservoir, water is transferred through a tunnel to Iron Canyon Reservoir, on Iron Canyon Creek.

The FERC boundary around McCloud Reservoir generally follows a contour line approximately 200 feet upslope of the high-water line of the reservoir. The McCloud Tunnel, a 13-foot- to 17-foot-diameter tunnel, conveys water from McCloud Reservoir to Iron Canyon Reservoir. A 100-foot-wide corridor for the McCloud Tunnel extends southeast for about 7.2 miles between McCloud and Iron Canyon Reservoirs. Where the McCloud Tunnel crosses Hawkins Creek, there is a 0.25-mile-long, 100-foot-wide corridor for the Hydroelectric Project access road (PG&E 2009).

3.1.1.2 McCloud Tunnel

Water impounded by McCloud Dam is diverted from the McCloud River via a 7.2-mile- long tunnel, and a 563-foot-long pipeline section at Hawkins Creek crossing, that hydraulically links McCloud Reservoir and Iron Canyon Reservoir. A tunnel intake structure and tower, about 17 feet in diameter, within McCloud Reservoir collects water for the McCloud Tunnel approximately 115 feet above the original riverbed, and then transfers the water southeasterly to Iron Canyon Reservoir. The differential in water surface elevations between the two reservoirs controls the amount of water drafted through the tunnel. Water diverted through the McCloud Tunnel diversion bypasses the reach of the McCloud River between the McCloud Reservoir and Shasta Lake, which is approximately 24 miles long.

3.1.1.3 Iron Canyon Dam and Reservoir

Iron Canyon Dam is a 214-foot-high and 1,130-foot-long earth-filled dam that impounds Iron Canyon Creek to create Iron Canyon Reservoir. The Iron Canyon Reservoir has a maximum storage capacity of

[8] Normal maximum water surface elevation is the maximum level to which water may rise under normal operating conditions, exclusive of any provision for flood surcharge.

24,241 ac-ft with about a 500-acre surface area. The Iron Canyon Dam has a slide gate leading to a 48-inch diameter pipe for instream flow releases to Iron Canyon Creek. Normal maximum water surface elevation within the reservoir is 2,664 feet msl.

Iron Canyon Creek is a tributary of the Pit River. Water from Iron Canyon Reservoir flows through the Iron Canyon Tunnel to the James B. Black Powerhouse. Water that flows through the James B. Black Powerhouse discharges into the Pit River. Once in the Pit River, the water flows through the Pit 6 and Pit 7 developments before entering Shasta Lake.

The FERC boundary around Iron Canyon Reservoir generally follows a contour line approximately 100 to 200 feet above the high-water line of Iron Canyon Reservoir, and in some places extends beyond this distance to include existing recreation facilities.

3.1.1.4 Iron Canyon Tunnel and Penstock

Iron Canyon Tunnel is a 2.9-mile-long, 14-foot to 18-foot-diameter tunnel that diverts water from Iron Canyon Reservoir. A 1,194-foot-long by 11.5-foot-diameter pipeline at the Willow Spring Creek crossing and a partially bifurcated 5,467-foot-long by 11.5-foot-diameter steel penstock deliver water from the Iron Canyon Tunnel to the James B. Black Powerhouse. The tunnel and penstock have a total flow capacity of 2,000 cubic feet per second (cfs). Water diverted through the Iron Canyon Tunnel bypasses the Iron Canyon Creek reach between Iron Canyon Reservoir and Pit 6 Reservoir, which is approximately 4 miles long.

3.1.1.5 James B. Black Powerhouse

James B. Black Powerhouse is located on the northwest bank of the Pit River, about 0.5 mile upstream of the Pit 5 Powerhouse (FERC Project No. 233). The James B. Black Powerhouse is a three-level, reinforced-concrete structure containing two vertical-shaft impulse turbines rated at 104,000 horsepower (hp) each. The turbines operate at a normal maximum gross head[9] of 1,226 feet. Two vertical axis outdoor generators, Unit 1 rated at 94.8 megavolt-ampere (MVA)[10] 8 and Unit 2 rated at 92.6 MVA, are connected to a three-phase, 86-MVA transformer bank. Their combined maximum capacity is 172 MW. Average annual generation within the past 30 years (1987 to 2016) at the station is 629.9-gigawatt hours (GWh). Water is discharged from the James B. Black Powerhouse through a tailrace leading directly from the generation units to the Pit River.

3.1.1.6 Transmission

The primary transmission lines for the James B. Black Powerhouse (230 kilovolt [kV]) extend about 0.5 mile from the transformer bank in the switchyard adjacent to James B. Black Powerhouse to the switchyard adjacent to the non-Project Pit 5 Powerhouse.

[9] The normal maximum gross head is the maximum allowed vertical distance between the upstream surface water (headwater) forebay elevation and the downstream surface water (tailwater) elevation at the tailrace.

[10] MVA is the measure of electrical capacity equal to the product of the voltage times the current. Electric equipment capacities are sometimes stated in MVA.

3.1.2 Pit 6 Development

3.1.2.1 Pit 6 Dam and Reservoir

Pit 6 Reservoir begins shortly below the Pit 5 Powerhouse (FERC Project No. 233) on the Pit River, and Pit 6 Dam is located approximately 5 miles downstream of James B. Black Powerhouse. Pit 6 Dam is a 183-foot-high, 560-foot-long concrete gravity dam with a crest elevation of 1,432 feet msl. The top of Pit 6 Dam contains a trash rake, motors for two 42-foot high by 49-foot long slide gates, and a control building. The control building houses a hydraulic system for two 8-foot-diameter low-level outlets at the base of Pit 6 Dam. The Pit 6 Reservoir has a maximum storage capacity of about 15,619 ac-ft and a maximum surface area of about 268 acres. The normal maximum water surface elevation of the reservoir is 1,425 feet msl. Pit 6 Reservoir serves as the forebay for the Pit 6 Powerhouse. Two 18-foot-diameter steel penstocks with a combined total flow capacity of 6,470 cfs extend 602 feet from the Pit 6 Dam to the Pit 6 Powerhouse turbines located at the base of the dam.

3.1.2.2 Pit 6 Powerhouse

Pit 6 Powerhouse is located along the east bank of the Pit River at the base of Pit 6 Dam. The powerhouse is a four-level, reinforced concrete structure, three levels of which are below grade. The structure contains two vertical-shaft, Francis reaction turbines, which are rated at 53,000 hp each and operate at a normal maximum gross head of 155 feet. There are two outdoor vertical axis generators, rated at 44 MVA each, with each unit connected to a three-phase, 44-MVA transformer bank that increases powerhouse output to 230 kV. The maximum generator capacity is 80 MW. Average annual generation between 1987 and 2016 was 341.2 GWh. Water is discharged from the Pit 6 Powerhouse directly into the Pit 7 Reservoir.

3.1.2.3 Transmission

The primary transmission lines for the Pit 6 Powerhouse extend about 3.3 miles from the switchyard adjacent to Pit 6 Powerhouse to PG&E's interconnected transmission system.

3.1.3 Pit 7 Development

3.1.3.1 Pit 7 Dam and Reservoir

Pit 7 Reservoir begins immediately downstream of Pit 6 Dam on the Pit River, and Pit 7 Dam is located 8 miles downstream of Pit 6 Powerhouse. Pit 7 Dam is a 228-foot-high by 770-foot-long concrete gravity dam. The top of Pit 7 Dam contains a trash rake, motors for two 49-foot by 42-foot slide gates at the crest of the dam, and a control building. The control building houses hydraulic controls for two, 8-foot-diameter low- level outlets at the base of the dam. Pit 7 Reservoir has a maximum storage capacity of 34,142 ac-ft and a surface area of about 468 acres at a normal maximum water surface elevation of 1,270 feet msl. The Pit 7 Reservoir serves as the forebay for Pit 7 Powerhouse. Two penstocks, 15 feet in diameter, extend 572 feet from the Pit 7 Dam to the turbines in the Pit 7 Powerhouse, located at the base of the dam. Total combined flow capacity within the penstocks is 7,440 cfs.

3.1.3.2 Pit 7 Powerhouse

Pit 7 Powerhouse is located along the east bank of the Pit River at the base of the Pit 7 Dam. The Pit 7 Powerhouse consists of a four-level reinforced concrete structure, three levels of which are below grade. The powerhouse contains two vertical-shaft, Francis reaction turbines that are rated at 70,000 hp each

and operate at a normal maximum gross head of 205 feet. Two vertical axis generators are rated at 52.2 (Unit 2) and 62.1 (Unit 1) MVA. Their maximum combined capacity is 112 MW. Each unit is connected to a three-phase, 58-MVA transformer bank that increases powerhouse output to 230 kV. The average annual generation over the last 30 years (1987 to 2016) is 470.3 GWh. Water from Pit 7 Powerhouse is directly discharged into Pit 7 Afterbay.

3.1.3.3 Transmission

The primary transmission lines for the Pit 7 Powerhouse extend about 3.5 miles from the switchyard adjacent to Pit 7 Powerhouse to PG&E's interconnected transmission system.

3.1.3.4 Pit 7 Dam and Afterbay

Pit 7 Afterbay has a surface area of about 69 acres at a normal maximum water surface elevation of 1,067 feet msl, which is the maximum water surface of Shasta Lake. The Pit 7 Afterbay Dam is a 30-foot-high, steel reinforced, rock-fill structure, including a variable width concrete gravity weir section.[11] Pit 7 Afterbay serves to attenuate flow discharging from Pit 7 Dam and Powerhouse before entering Shasta Lake, which abuts and sometimes inundates the Afterbay.

3.1.4 Routine Operations and Maintenance

Under the current FERC license, the Hydroelectric Project operates both as a peaking system and a load-following system throughout the year, using the available water supply after satisfying MIF requirements (FERC 2011).

James B. Black, Pit 6, and Pit 7 Powerhouses are typically operated on a peaking basis. The powerhouses' output varies on an hourly basis from minimum or no load during the off-peak periods, up to the powerhouses' maximum output during peak demand periods. During the mid-peak demand periods, the powerhouses are operated near their more efficient loads depending on the available flow. During periods of high flow, the powerhouses are normally operated at their maximum capacities in order to minimize spill (FERC 2011); however, at Pit 6 and Pit 7 dams spill would have no effect on flows because the powerhouses are located at the base of each dam.

Operations of McCloud and Iron Canyon Reservoirs are coordinated to optimize use of water. The movement of water through the McCloud Tunnel from McCloud Reservoir to Iron Canyon Reservoir, and then through the Iron Canyon Tunnel and penstock from Iron Canyon Reservoir to James B. Black Powerhouse, is carefully planned in order to prevent spills at Iron Canyon Reservoir and minimize spills at McCloud Reservoir. The water surface elevation in Iron Canyon Reservoir is regulated through the operation of James B. Black Powerhouse. The relative level of McCloud Reservoir and Iron Canyon Reservoir determines the rate of flow through the McCloud Tunnel that connects the two reservoirs. When spill conditions are forecasted because of high inflows to the reservoirs, Iron Canyon Reservoir is drawn down to avoid use of its spillway, to maximize the McCloud Tunnel flow, and to minimize spill at McCloud Dam. While Iron Canyon Reservoir is operated to prevent spill, the McCloud Reservoir, on average, spills about four out of every ten years (FERC 2011).

PG&E has 72 employees based at their Burney Service Center facility for operation of its facilities. These employees spend approximately 25 percent of their work hours on the operation and maintenance of the

[11] A gravity weir is a solid obstruction put across a river to raise its water level.

existing Hydroelectric Project. The frequency of staff visits to Hydroelectric Project facilities is summarized as follows:

- Each of the five dams within the existing McCloud-Pit Project are visited weekly by an operator and maintenance staff on separate days;
- Five days a week, the three powerhouses are visited on rotation by an operator;
- Two days a week, the three powerhouses are visited on rotation by maintenance staff; and
- A planned two-week outage may occur once a year requiring up to 24 personnel visiting the powerhouses daily during the outage.

The operation and maintenance practices for existing Hydroelectric Project infrastructure are shown on Table 3-1. Table 3-2 provides the location and identification number of gages in the Hydroelectric Project area.

Table 3-1. Routine Operations and Maintenance Practices for Existing Hydroelectric Project Infrastructure

Area Type	Maintenance Activity	Frequency	Relevant Hydroelectric Project Area	Description
Roads	Snow removal	Two to three times per year; during winter.	• Oak Mountain Road • McCloud Reservoir Road (Forest Road 11 to boat ramp only; done infrequently, as access to reservoir needed) • Pit 6 Road	Removal is usually done using a pickup truck or 10-wheel dump truck with snow blade attachment. A road grader may also be used to remove heavy snow deposits.
Roads	Grading of dirt and gravel roads	A few times per year; during spring.	• Oak Mountain Road	Procedure entails grading approximately three feet off the edge of the road (including gutter).
Roads	Vegetation trimming and hazard tree removal	Every other year.	• Oak Mountain Road • Pit 6 Road • Pit 7 Road and Pit 7 Afterbay Road	Procedure is to lop and scatter on the side of the road or chip and blow.
Roads	Slide debris removal	As needed year-round.	• Oak Mountain Road • Pit 6 Road • Pit 7 Road • Pit 7 Afterbay Road and associated areas	Slides of 20 yards or more are repaired with a pickup truck with snow blades or a 10-wheel dump truck with blade. Slides of less than 20 yards are repaired with the use of loaders, excavators, and a dump truck. Material is hauled to designated site.
Roads	Ditch and culvert cleaning	Annually; during summer or fall.	• Pit 6 Road • Oak Mountain Road	Cleaning performed with a backhoe and hand shoveling.

Area Type	Maintenance Activity	Frequency	Relevant Hydroelectric Project Area	Description
Roads	Paved road asphalt repairs	Annually; during summer.	• Pit 6 Road • Pit 7 Road	Pickup trucks, 10-wheel dump trucks, loaders, backhoes, graders, and hand tools are used.
Powerhouses, dams, switchyards, tunnels, penstocks, and gages	Herbicide spraying	Pre-emergent herbicide followed by post emergent during May/June.	• Powerhouses (James B. Black, Pit 6, Pit 7) • Dam faces, including groins (Pit 6, Pit 7, Pit 7 Afterbay, Iron Canyon, McCloud) • James B. Black Penstock • Tunnels (Iron Canyon Tunnel at Willow Creek Siphon, the conduit at Hawkins Creek Crossing) • Iron Canyon Surge Chamber	At powerhouses, pre-emergent is applied by hand early in the year; after leaf-out has occurred, another herbicide is applied to perennial vegetation. At all other facilities, grass material is allowed but woody material is targeted for removal. Dam face groins are kept completely clear of vegetation.
Powerhouses, dams, switchyards, tunnels, penstocks, and gages	Vegetation clearing	As needed year- round.	• Powerhouses (James B. Black, Pit 6, Pit 7); within fenced perimeter up to a 5-ft buffer outside the fence • Dam faces, including groins (Pit 6, Pit 7, Pit 7 Afterbay, Iron Canyon, McCloud) • Gages MC-1 and MC-10	Follows herbicide spraying. At dam faces, grass material allowed but woody material targeted for removal. Dam face groins kept completely clear of vegetation.
Powerhouses, dams, switchyards, tunnels, penstocks, and gages	Maintain trails	As needed year-round.	• Gages MC-1 and MC-10	Trim vegetation encroaching the path of travel and lop and scatter trimmings. Use of shovels to redirect runoff and abate erosion.
Transmission and Distribution lines	Hazard tree removal	Annually patrolled for compliance.	• 12-kV distribution line • James B. Black Transmission Line • Pit 6 Transmission Line • Pit 7 Transmission Line	Lines patrolled by vehicle, off-highway vehicle, or on foot, as appropriate. In sites with more difficult access, trimmed vegetation is lopped and scattered. In accessible sites, trees are chipped, and the material removed off-site. Herbicide application is applied to prevent re-sprouting.

Area Type	Maintenance Activity	Frequency	Relevant Hydroelectric Project Area	Description
Transmission and Distribution lines	Vegetation clearing	Annually patrolled for compliance.	• 12-kV distribution line • James B. Black Transmission Line • Pit 6 Transmission Line • Pit 7 Transmission Line	Clearing is conducted beneath wires, including a 10-ft buffer and the 40-ft border area. In Year 1 the site is masticated/mowed. In Year 2 the site is inspected to determine if follow-up herbicide application is necessary. Two to three years following, the site is re-inspected to determine what treatment needed. Recruiting trees are removed by hand or via individual herbicide applications.
Transmission and Distribution lines	Herbicide spraying[a]	As needed.	• 12-kV distribution line • James B. Black Transmission Line • Pit 6 Transmission Line • Pit 7 Transmission Line	Herbicide applications are all ground-based to individual plants. Generally, a backpack unit is used 90 percent of the time and a tank is used ten percent of the time.
Spoil pile sites	Site grading	Every 3–5 years, as needed.	• Downstream end of Pit 6 and Pit 7 roads • Base of McCloud Dam • Conduit at Hawkins Creek Crossing	Grade maintained so site acts as a catch basin.
Spoil pile sites	Material burning	Approximately once per year, as needed.	• Downstream end of Pit 6 and Pit 7 roads • Base of McCloud Dam • Conduit at Hawkins Creek Crossing	Includes floating debris removed from reservoirs, material removed from gutters, and slide debris.
All Hydroelectric Project Areas	Employee awareness training	Annual refresher training.	• All Hydroelectric Project Areas	Training includes prevention of weed transport (via dirty vehicles), cleaning procedures for rental equipment, cleaning procedures when moving between watersheds, protection of special status occurrences, and elderberry identification information.

Notes:

[a] Herbicide applications are prescribed in a recommendation prepared by a licensed Pest Control Adviser to treat a specific site and condition. Herbicides commonly used contain one or more of the following listed active ingredients (although other suitable pesticides may be available and appropriate for a given situation): Chlorsulfuron; Clopyralid; Oxyfluorfen; Fluazifop-P; Glyphosate; Dithiopyr; Imazapyr; Isoxaben; Oryzalin; Prodiamine; Sulfometuron; Flumioxazin; Triclopyr; and Aminopyralid.

Table 3-2. Hydroelectric Project Gages

Location	USGS[a] Gage No.	PG&E Gage No.
McCloud River near McCloud	11367500	MC-3
McCloud Reservoir Storage	11367740	MC-6
McCloud-Iron Canyon Diversion Tunnel	1367720	MC-8
McCloud River below McCloud Dam	11367760	MC-7
McCloud River near Ah-Di-Na	11367800	MC-1
McCloud River Above Shasta Lake	11368000	MC-5
Iron Canyon Reservoir Storage	11363920	MC-9
Iron Canyon Creek below Iron Canyon Dam	11363930	MC-10
Pit River at Big Bend	11363000	PH-27
James B. Black Powerhouse	11363910	MC-11
Pit 5 Powerhouse (FERC Project No. 233)	11362700	PH-69
Pit 6 Reservoir Storage	11364100	PH-58
Pit 6 Powerhouse	11364150	PH-63
Pit 7 Reservoir Storage	11364700	PH-59
Pit 7 Powerhouse	11364800	PH-64
Pit River near Montgomery Creek (downstream of Pit 7 Dam)	11365000	PH-47

Notes:
[a] United States Geological Survey

3.1.5 Existing Recreation Facilities

There are three developed recreation areas within the Hydroelectric Project boundary: (1) Tarantula Gulch boat ramp at McCloud Reservoir; (2) Deadlun Creek Campground at Iron Canyon Reservoir; and (3) Hawkins Landing Campground and boat ramp at Iron Canyon Reservoir. All of these facilities are located within the James B. Black Development.

There are no developed recreation sites within the Hydroelectric Project boundary in the lower Pit River; however, dispersed recreation is evident in a few locations on the Lower McCloud River and Hawkins Creek Crossing (FERC 2011). In addition, Fenders Flat is an existing unimproved recreation area within Shasta-Trinity Recreation Area adjacent to the Pit 7 Afterbay Dam. It is currently available for public recreation use.

3.1.5.1 McCloud Reservoir

Existing recreation facilities in the vicinity of McCloud Reservoir are shown on Figure 3-1.

The Tarantula Gulch boat ramp, which was constructed by PG&E and is operated by the USFS, includes a boat ramp and a developed picnic area. Specific recreation facilities include:

- Single lane concrete boat launch ramp;
- Loading dock;
- Overflow parallel parking with unmarked spaces;

- 22 parking spaces for vehicles with trailers;
- Three picnic tables;
- Four wildlife-resistant trash receptacles; and
- Vault restroom with two unisex accessible stalls.

The bottom of the boat ramp is one foot below the normal minimum operating reservoir level (elevation 2,634 feet) and typically provides boater access during the entire recreation season (May 15 to October 15). The USFS reports that sediment and debris accumulate on the ramp and occasionally impede boat launching (FERC 2011).

The majority of lands surrounding McCloud Reservoir are privately owned. The USFS and PG&E lands that are accessible to the public are located on the southern end of the reservoir, extending from near the access road to Tarantula Gulch and continuing across McCloud Dam to Star City Creek (

Figure 3-1). Dispersed recreation is allowed on PG&E and USFS lands, unless otherwise designated. PG&E identified nine user-created dispersed recreation sites at lower-gradient access points accessible from Star City Road around McCloud Reservoir, and a dispersed campsite on an island in McCloud Reservoir. The Star City Creek area is the largest dispersed site at McCloud Reservoir, offering primitive camping on approximately 13 acres.

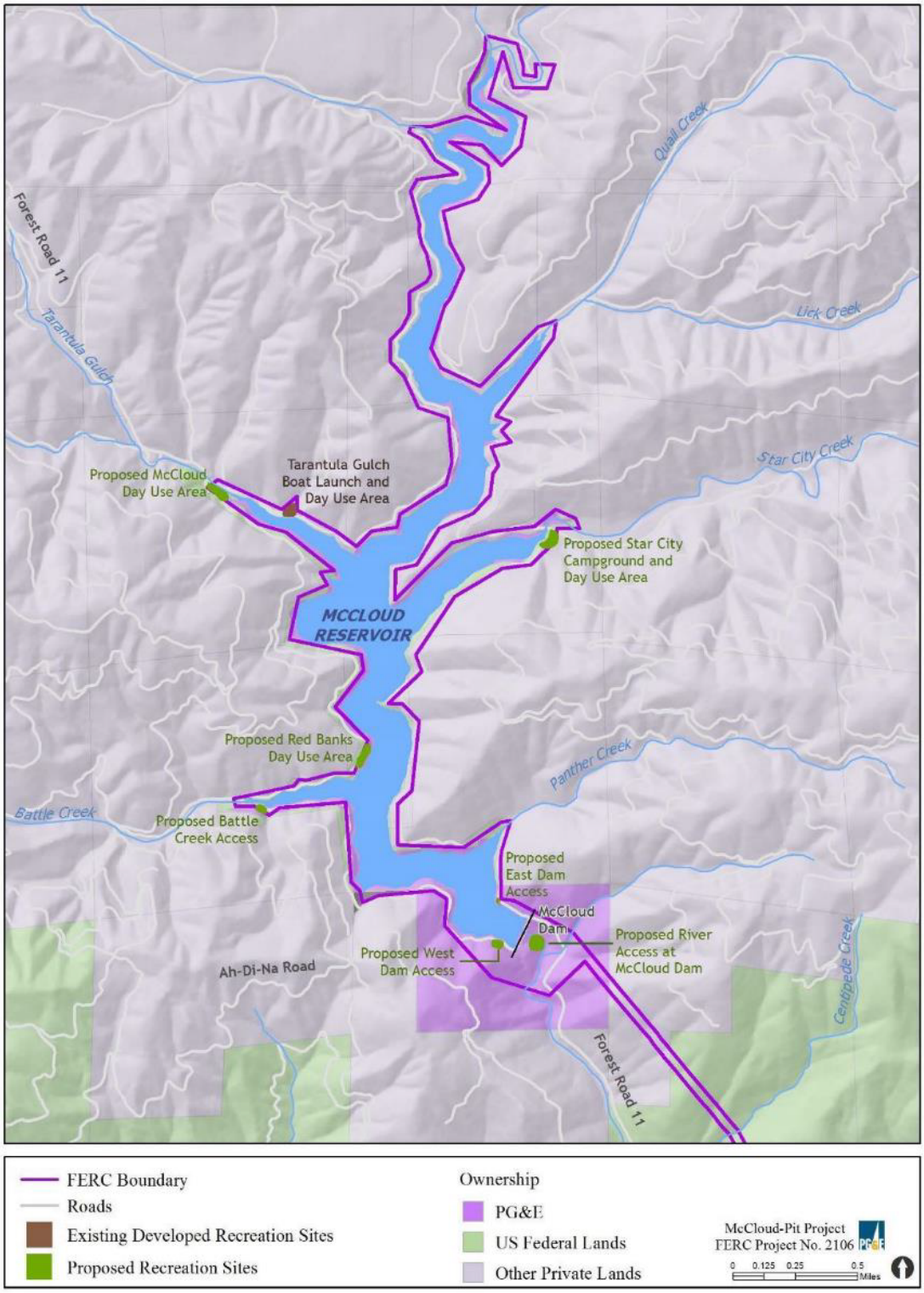


Figure 3-1. Recreation Facilities in the Vicinity of McCloud Reservoir

3.1.5.2 Iron Canyon Reservoir

There are two developed recreation areas at Iron Canyon Reservoir, which include:

- Hawkins Landing Campground and boat ramp, which is owned and operated by PG&E and comprises of: one single lane concrete launch ramp; 11 campsites with fire rings and picnic tables; one non-potable water hand pump; one trash receptacle; and two vault toilets.
- Deadlun Campground, which is owned and operated by the USFS and comprises of: 27 campsites with fire rings and picnic tables; three vault restrooms with single, unisex, ADA-accessible stalls; and overflow parallel parking with unmarked spaces (Figure 3-2).

Hawkins Landing Campground and boat ramp have the only boat launch ramp on Iron Canyon Reservoir. No formal parking is available at the boat launch and the number of vehicles that the boat launch area can accommodate depends on reservoir elevation.

Normal Hydroelectric Project operations can cause Iron Canyon Reservoir to fluctuate on a daily basis, which affects the availability of parking at the shoreline near the boat launch. When the reservoir is at full pool (2,664 feet in elevation), visitors park vehicles in Hawkins Landing Campground. As the elevation of Iron Canyon Reservoir lowers, more shoreline is exposed and visitors park along the shoreline, thereby increasing the potential number of vehicles that can park near the launch area. Since 1996, PG&E has voluntarily maintained the reservoir water surface elevation above 2,615 feet to keep the boat ramp usable during the primary recreation season from May 15 to October 15.

The majority of lands surrounding Iron Canyon Reservoir are PG&E or USFS lands. Recreation user-created access trails (pedestrian and off-highway vehicles) originate from both campgrounds and nearby areas providing dispersed shoreline access. PG&E has identified 22 dispersed recreation sites around Iron Canyon Reservoir with heavily used dispersed recreation sites at the areas adjacent to Deadlun Campground and Iron Canyon Reservoir spillway.

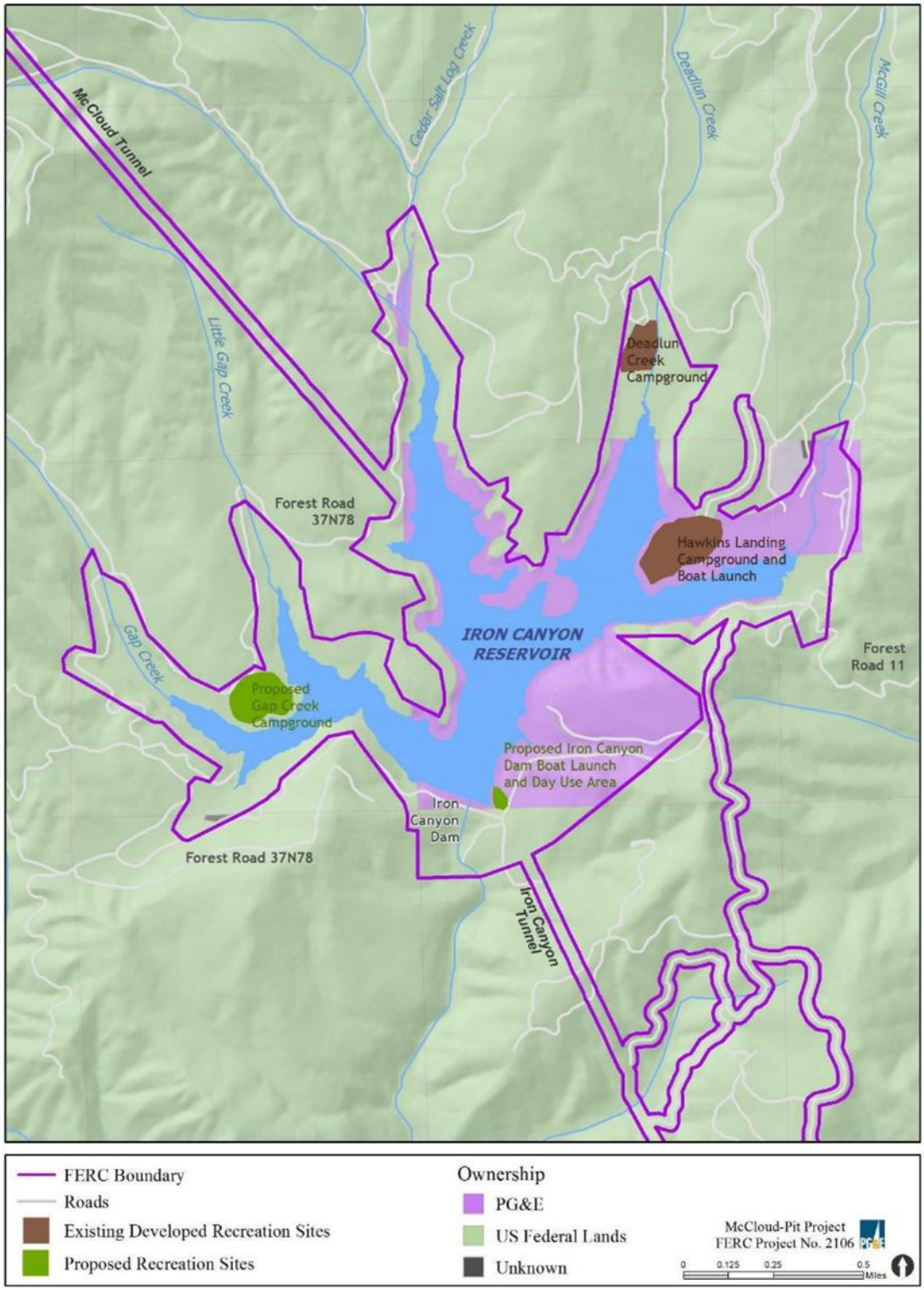


Figure 3-2. Recreation Facilities in the Vicinity of Iron Canyon Reservoir

3.1.5.3 Lower McCloud River and Hawkins Creek Crossing

Recreation areas downstream of McCloud Reservoir include the area at Hawkins Creek crossing (inside the Hydroelectric Project boundary) and the Lower McCloud River (outside the Hydroelectric Project boundary). Hawkins Creek crossing is a cleared level area where the McCloud Tunnel crosses Hawkins Creek, about one mile above the confluence with the Lower McCloud River. PG&E documented several dispersed recreation sites including: two dispersed recreation sites near Ash Camp; a dispersed campsite on Hawkins Creek at Hawkins Creek Tunnel that is accessible via a PG&E Hydroelectric Project road; and a dispersed campsite on the PG&E spoil pile area on Hawkins Creek that is just north of the Hawkins Creek Tunnel (FERC 2011).

The Lower McCloud River extends 24 river miles from McCloud Dam to Shasta Lake, but only the upper nine miles of this 24-mile reach have land-based public access within USFS lands. No Hydroelectric Project lands are located along the Lower McCloud River except for the area immediately below McCloud Dam.

3.1.6 Existing Recreation Facilities Routine Operations and Maintenance

PG&E currently employs one caretaker to conduct routine operations and maintenance at Hawkins Landing and one full-time security guard to enforce public access restrictions near Pit 7 Afterbay. Additionally, the USFS provides operation and maintenance personnel at Deadlun Campground and Tarantula Gulch Boat Launch.

During the off season, when recreation use significantly decreases, the number of caretakers onsite and the operation and maintenance effort is similarly reduced. Many existing recreation facilities are closed during the off season.

The caretakers' daily activities include the following: cleaning facilities; picking up litter; reporting potential public safety hazards; correcting unsafe conditions; collecting fees; maintaining daily campground occupancy records; pest management; managing signs; operating water systems; performing minor maintenance and repairs on existing facilities; water treatment and testing; dumpster waste removal; and hazard tree removal; however the septic pumping of the sealed vault toilets are typically contracted to third parties.

3.1.7 Project Safety

The Hydroelectric Project is currently operating under the existing FERC license and annual license extensions, during which time FERC staff have conducted operational inspections focused on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operation, compliance with the terms of the license, and proper maintenance. In addition, the Hydroelectric Project has been inspected and evaluated every 5 years by an independent consultant, and a consultant's safety report has been filed for FERC's review. As part of the relicensing process, the FERC staff would evaluate the adequacy of the Hydroelectric Project facilities under a new license. Special license articles would be included in any license issued, as appropriate. FERC staff would continue to inspect the Hydroelectric Project during the new license term to assure continued adherence to FERC-approved plans and specifications; special license articles relating to construction, operation, and maintenance; and accepted engineering practices and procedures (FERC 2011).

3.1.8 Previously Adopted Environmental Components

As part of the original environmental permitting process for the Proposed Project in 2019, the SWB issued water quality certification conditions to reduce impacts to water quality and beneficial uses in the Proposed Project area. PG&E is also subject to similar, impact-reducing conditions under Section 4(e) of the Federal Power Act, as administered by the USFS. Notably, these measures would be implemented by PG&E with or without approval of the Proposed Project, because they are tied to PG&E's FERC license. Together, these conditions are referred to in this document as Environmental Components. They are not considered mitigation measures under CEQA, but are treated as part of the Proposed Project. Existing impacts of past Hydroelectric Project operations are part of the baseline environmental condition, and the anticipated impacts of continuing Hydroelectric Project operations without implementation of Proposed Project components including the Environmental Components are addressed in the discussion of the No Project Alternative.

The USFS management and monitoring plans are described below including components in each plan that are required per the USFS Final Section 4(e) Conditions. (Appendix C) also includes additional SWB conditions that require development of management and monitoring plans (e.g., Facility and Gage Modifications, Fish Stocking, Long-Term Ramping Rates, and Whitewater Recreation).

Under the USFS Final Section 4(e) Conditions for the Proposed Project, dated November 29, 2010, PG&E is required to finalize and file with FERC for approval the following 13 environmental management/monitoring plans:

- Aquatic Biological Monitoring Plan
- Coarse Sediment Management Plan
- Historic Properties Management Plan[12]
- Erosion and Sediment Control Management Plan
- Fire and Fuels Management Plan
- Large Woody Debris Plan
- Recreation Development and Management Plan
- Road and Transportation Facility Management Plan
- Sign and Interpretive/Education Plan
- Terrestrial Biological Management Plan

[12] In FERC's final EIS, FERC considered the Historic Properties Management Plan that PG&E filed on October 26, 2010 to be final. On May 20, 2011, FERC executed a Programmatic Agreement to implement the 2010 Historic Properties Management Plan with the California State Historic Preservation Officer. The Historic Properties Management Plan contains provisions allowing for amendment if additional information is provided by the USFS, Winnemem Wintu Tribe, and Pit River Tribe in the future.

- Vegetation and Invasive Weed Management Plan
- Visual Quality Management Plan
- Water Quality and Water Temperature Monitoring Plan

The USFS plans are described below including components in each plan that are required per the USFS Final Section 4(e) Conditions. All of these plans, including the SWB Final 401 Certification Conditions (Appendix C), will require finalization and approval by appropriate state and federal resource agencies prior to implementation, including the SWB (as specified in the Final 401 certification [see Appendix C]). If that process results in modifications of these Environmental Components, the SWB will evaluate the modifications in accordance with CEQA Guidelines Section 15162(b). Any of the draft environmental management plans that are incorporated as a condition of the certification of this SEIR will require approval by the Deputy Director for the Division of Water Rights (Deputy Director) prior to implementation. The Deputy Director may make modifications to a draft plan as a condition of approval.

3.1.8.1 Aquatic Biological Monitoring Plan

USFS Final Section 4(e) Condition 27 Aquatic Biological Monitoring Plan and SWB Final 401 Condition 7, Biological Resources require the development of an Aquatic Biological Monitoring Plan. The Aquatic Biological Monitoring Plan described below is incorporated into the Proposed Project that was submitted to the SWB for certification. The Aquatic Biological Monitoring Plan will define how to monitor the status of trout and other fish populations, benthic macroinvertebrate (BMI) populations, and special status aquatic species in the Lower McCloud River, Iron Canyon Creek, and Pit 7 Reservoir under the new MIF requirements and other changes stipulated in the new license. Under Condition 27 of the USFS Final Section 4(e) Conditions, the Aquatic Biological Monitoring Plan will include the following components:

- Fish population trend assessment in Iron Canyon Creek and the Lower McCloud River with monitoring at specific intervals;
- Standardized sampling and data protocols consistent with relicensing studies, to the extent possible, to ensure comparability of survey results with existing data;
- For Lower McCloud River and Iron Canyon Creek, periodic survey once every three years for the first nine years following the first full year of the new license required MIF, and then once every five years for the term of the license. For Pit 7 Reservoir, periodic survey once every five years following license acceptance;
- BMI monitoring component using the Surface Water Ambient Monitoring Program, or current protocol, including population heterogeneity, composition, and trends;
- Aquatic special status species (e.g., western pond turtles, foothill yellow-legged frogs) protocol and schedule for monitoring within the Proposed Project waters and rivers;
- Protocols to monitor for and prevent introduction of invasive aquatic species, consistent with SWB and CDFW regulations;
- Report of all aquatic survey and monitoring results within one year of data collection, with a USFS GIS compatible map that includes base data from all post-licensing surveys; and
- Periodic monitoring of fish passage conditions at Gap Creek, Deadlun Creek, and Cedar Salt Log Creek Road crossings around Iron Canyon Reservoir.

3.1.8.2 Coarse Sediment Management Plan

USFS Final Section 4(e) Condition 23 Coarse Sediment Management Plan and SWB Final 401 Condition 6 Gravel Augmentation require the development of a Coarse Sediment Management Plan. The Coarse Sediment Management Plan described below, is incorporated into the Proposed Project that was submitted to the SWB for certification. The goal of the Coarse Sediment Management Plan is to provide an adaptive management framework for the collection, storage, and augmentation of coarse sediment into the Lower McCloud River below McCloud Dam. The Coarse Sediment Management Plan requires monitoring of gravel and coarse sediment augmentation that could benefit downstream aquatic habitat in the Lower McCloud River, as well as evaluation of possible gravel and coarse sediment sources. Implementation of the plan would require the addition of 150 to 600 tons of gravel and coarse sediment to the Lower McCloud River below McCloud Dam. The anticipated source of the gravel and coarse sediment is the Star City Creek delta in McCloud Reservoir.

Under Condition 23 of the USFS Final Section 4(e) Conditions, the Coarse Sediment Management Plan will include the following components:

- Identify the source(s) of coarse sediment;
- Identify the location(s) for coarse sediment introduction, and the facilities or improvements necessary for accessing the Lower McCloud River below McCloud Dam;
- Identify coarse sediment storage sites;
- Develop a schedule for coarse sediment placement; and
- Include an adaptive management component to allow non-delivery of coarse sediment in non-spill years or in years when spring flows are insufficient to mobilize the sediment from the placement site(s) or increased augmentation above the minimum 150 tonnes if mobilization and dispersal monitoring results indicate capacity for greater quantities of coarse sediment.

If practical, the excavation of coarse sediments from the Star City Creek delta would only occur once or twice over the term of the new license. Gravel and coarse sediments would only be excavated from within the dry portion of the Star City Creek delta, once the water line is below the area accessible to ground-based equipment. Coarse sediments are defined as sediment ranging in size from approximately 8 to 128 mm. Sorting of the material would be required in order to remove the portion of material composed of sand and finer particles (0-8 mm). A gravel shaker machine or similar mechanical device would be used to accomplish the sieving and size sorting process. Material larger than 128 mm and smaller than 8 mm would be sorted out and would not be used. PG&E would have the option of transporting all of the sediment to a storage area(s) and sorting it in the storage area(s) or sorting the material onsite in the Star City Creek delta and transporting only the sorted material to the storage area(s).

Any non-suitable material left onsite may be used for recreation development at this site as per the Recreation Development Management Plan (e.g., beach sand). Dump trucks or lowboys may be used to transport material to the storage area(s).

While Tarantula Gulch appears to be a potentially suitable source for coarse sediment, the volume of material available at the Star City delta (roughly 16,200 tons) is estimated to meet the total Proposed Project need (Nevares and Stallman 2010). As a result, it is assumed that the Star City Creek delta would

be the sole source of coarse sediment; however, all descriptions of activities for the Star City Creek delta would also apply to the Tarantula Gulch delta if it becomes a future source for coarse sediment during the license term. Using coarse sediment from the Tarantula Gulch delta would only be pursued in the event that using the Star City Creek delta deposit is found to be infeasible at any point over the duration of the License.

Areas within the delta where sediments are extracted would be re-contoured to remove hazards or obstacles, and all temporary access roads to the reservoir inlet would be closed. If coarse sediment sorting occurs in the Star City Creek delta, the remaining material (e.g., non-suitable material) would be treated according to one of the following procedures: (a) re-contour over the delta so as to not create obstacles for boaters and recreationists, and to open water passage to the Star City Campground and Day Use Area during low water periods; or (b) remove and haul to a disposal site. The final treatment would be determined in consultation with resource agencies.

Once coarse sediment is placed in the Lower McCloud River, it will be transported downstream by high flows prior to a subsequent coarse gravel augmentation event. Flow events large enough to mobilize gravel do not occur every year; therefore, it is unlikely gravel augmentation would take place in consecutive years. During years when augmentation is implemented, the gravel will be hauled from the storage area at the Hawkins Creek Tunnel Crossing to the base of McCloud Dam. It is anticipated that 24 truckloads will be required to haul the planned 600 tons of gravel from the storage area to the river.

Gravel augmentation would be completed consistent with spill prevention and Best Management Practices (BMPs). Appropriate spill equipment would be kept onsite to contain and clean up any spill caused by equipment failure. No petroleum products, chemicals or other hazardous material would be allowed to enter or be disposed of in a manner that it could enter the McCloud Reservoir or McCloud River. There would be no fueling, lubrication, or maintenance of equipment within at least 500 feet of McCloud Reservoir or the McCloud River.

3.1.8.3 Historic Properties Management Plan (HPMP)

In its final EIS, FERC determined the HPMP that PG&E filed on October 26, 2010 to be final. On May 20, 2011, FERC and the California SHPO executed the Programmatic Agreement to implement the final HPMP (PG&E 2010).

The HPMP, which has been incorporated into the Proposed Project presented to the SWB for certification, outlines continued adherence to federal and state laws and regulations, and regular communication with other agencies, the Pit River Tribe, and the WWT regarding the management of historic properties within the Proposed Project's Area of Potential Effect (APE). The APE is the study area as identified for the Proposed Project in consultation with the California Office of Historic Preservation. The HPMP also specifies general treatment measures for operations and maintenance (including road maintenance); the management of ethnobotanical resources; avoidance, monitoring, stabilization, data recovery, curation, and other treatment measures pertaining to historic properties; and accidental discovery of archaeological sites or human remains.

As stated in the HPMP, PG&E will request a Qualified Tribal Cultural Monitor to be present from the Pit River Tribe and WWT during archaeological surveys, site testing, data recovery, non-emergency construction, and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring. If the Pit River Tribe and

WWT do not provide the contact information of a Qualified Tribal Cultural Monitor by the day before the date that the monitor is needed, PG&E may proceed with the activity.

Other protocols and procedures that are also provided in the HPMP include educating the public and PG&E staff on protecting cultural resources, inadvertent discoveries, emergency situations, curation of recovered cultural materials, future studies, Proposed Project patrolling, monitoring of cultural resources, and general consultation. The stipulations in the HPMP are enhanced by USFS Final 4(e) Condition 34. In addition, PG&E will determine the eligibility of the existing hydroelectric facilities for inclusion on the National Register of Historic Places and California Register of Historic Resources at the time of license issuance and when the Hydroelectric Project facilities are 50 years old.

3.1.8.4 Erosion and Sediment Control Management Plan

USFS Final Section 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management, require the development of an Erosion and Control Sediment Management Plan. The Erosion and Sediment Control Management Plan described below, is incorporated into the Proposed Project that was submitted to the SWB for certification. The Erosion and Sediment Control Management Plan will inventory, record, treat, and monitor erosion and sedimentation impacts within the Proposed Project area and on Proposed Project-affected USFS lands and waters; and minimize future erosion and sedimentation using PG&E BMPs and USFS regulations and guidance.[13]

Under Condition 22 in the USFS Final Section 4(e) and SWB Final 401 certification Condition 5, Erosion and Sediment Management, the Erosion and Sediment Control Management Plan will include, but may not be limited to the following components:

- Methods for initial and periodic inventory and monitoring of the entire Proposed Project area and Proposed Project-affected National Forest Service lands to identify erosion sites and assess site condition for each, using protocols established in relicensing study GS- S1 (Nevares et al. 2009). Periodic monitoring and inventory will include recording effectiveness of erosion treatment measures, and identification of new erosion sites for the term of the new license;

- Criteria for ranking and treating erosion sites, including a risk rating and hazard assessment for scheduling erosion treatment measures and monitoring at each site using protocols developed in relicensing study GS-S1 (Nevares et al. 2009);

- Erosion control measures that incorporate current standards, follow USFS regulations and guidance (e.g., Land and Resource Management Plan, Road Management Objectives [RMOs], BMPs), are customized to site-specific conditions, and approved by the USFS;

- Develop and implement a schedule for treatment (e.g., repair, remediate, monitor) of erosion sites, including a list of sites requiring immediate attention and a schedule for implementation. Priority will be placed on the 56 sites ranked as having high erosion potential in study results from GS-S1 (Nevares, Stallman, and Bowers 2009). All sites (high, moderate, and low priority, and any new sites added as a result of periodic monitoring) will be scheduled for treatment as described in the Implementation Plan (Exhibit Erosion and Sediment Control Management Plan);

[13] *Water Quality Management for Forest System Lands in California* (USFS 2000) provides a set of standardized BMPs to protect water quality during the planning and construction of projects. The BMPs are organized into eight land use activity categories including Road and Building Site Construction and Watershed Management.

- Effectiveness monitoring of completed erosion control treatment measures for a period of up to three years after treatment in order to determine if further erosion control measures are needed;
- Protocols for emergency erosion and sediment control; and
- Process for documenting and reporting inventory and monitoring results, including periodic plan review and revision. Documentation shall include a USFS compatible GIS database for maps keyed to a narrative description of detailed, site-specific, erosion treatment measures and sediment monitoring results.

3.1.8.5 Fire and Fuels Management Plan

USFS Final Section 4(e) Condition 33 requires the development of a Fire and Fuels Management Plan. The Fire and Fuels Management Plan described below has been incorporated into the Proposed Project submitted to the SWB for certification, and will provide information necessary for preventing, preparing for, suppressing, reporting, and investigating fires associated with the Proposed Project. The Fire and Fuels Management Plan will also identify the following: hazard reduction/fuel treatment measures; actions and locations of resources needed for fire prevention and response; and a process for reporting fires and providing necessary documents associated with any fire investigation to protect the Proposed Project and USFS resources over the term of the license.

Under Condition 33 in the USFS Final Section 4(e) Conditions, the Fire and Fuels Management Plan will include, but may not be limited to the following components:

- Fuels treatment
- Prevention and response
- Access and safety
- Emergency response preparedness
- Reporting and response
- Investigation of Proposed Project-related fires
- Post-fire activities

Other aspects of fuels management primarily related to vegetation treatments, including powerline clearance, are contained in the Vegetation and Invasive Weed Management Plan (see Section 3.1.8.11).

In addition to the Fire and Fuels Management Plan, PG&E recently submitted its WSP in response to SB 901, which requires all California electric utilities to prepare plans on constructing, maintaining, and operating their electrical lines and equipment to minimize the risk of catastrophic wildfire (PG&E 2019).

3.1.8.6 Large Woody Debris Management Plan

USFS Final Section 4(e) Condition 21 and SWB Final 401 certification Condition 4 Large Woody Material, require the development of a Large Woody Debris Management Plan. The Large Woody Debris

Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification, and will provide a framework and guidelines for the removal of large woody debris (LWD) from McCloud Reservoir, and subsequent placement of LWD into the McCloud River below the McCloud Dam to augment recruitment of wood during high water flows, and contribute to the amount and quality of aquatic habitat along channel margins and in riparian habitat above the low-flow channel. Under condition 21 in the USFS Final Section 4(e) Conditions, the Large Woody Debris Management Plan will specify: (a) size criteria; (b) storage and placement sites; and (c) volume and frequency of placement, including monitoring procedures that assess the mobilization of LWD from the augmentation site. Refer to Figure 3-3 for proposed LWD sites.

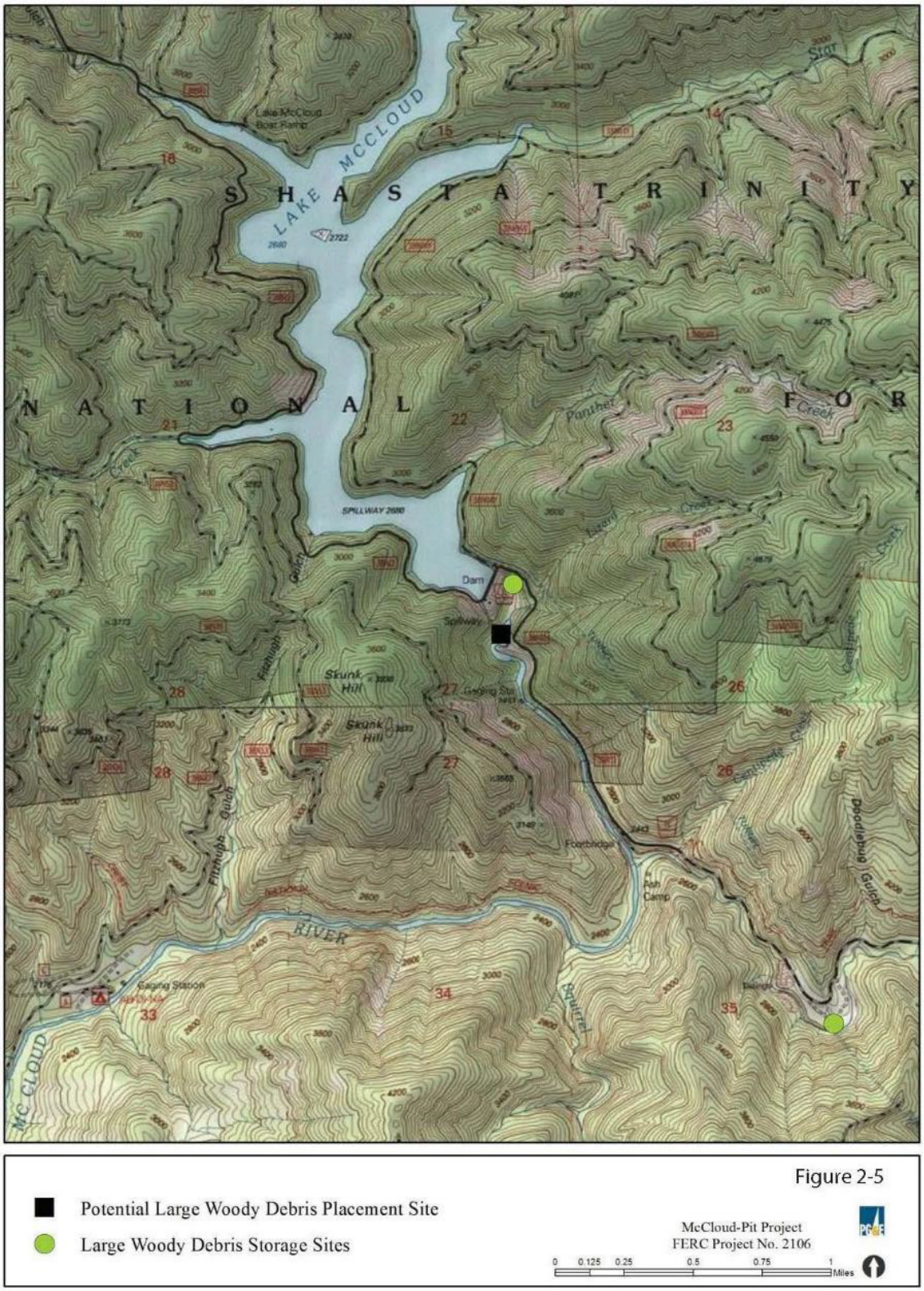


Figure 3-3. Large Woody Debris Sites

3.1.8.7 Recreation Development and Management Plan

USFS Final Section 4(e) Condition 30 requires the development of a Recreation Development and Management Plan. The Recreation Development and Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification, and describes the specific tasks, components, and products that will guide the management of recreation resources and opportunities associated with the Proposed Project. The SWB Final 401 Certification Condition 9 Recreation Facilities Management (see Appendix C) reflect the USFS 4(e) Conditions and FERC conditions, with modifications to provide for review and approval of not-yet-finalized management plans.

Under condition 30 in the USFS Final Section 4(e) Conditions, the Recreation Development and Management Plan will include, but may not be limited to the following components:

- Operation and Maintenance: Development and implementation of an Operation and Maintenance component (including fee collection and retention) for all Proposed Project recreation facilities.

- Recreation Survey and Monitoring: Development and implementation of a periodic Recreation Survey and Monitoring component with a report that is filed with FERC after USFS approval.

- Proposed Project Patrol: Development and implementation of a Project Patrol Plan for Proposed Project and Proposed Project-affected USFS lands.

- Reservoir Water Surface Management: Development and implementation of a Reservoir Water Surface Management component that addresses recreation user safety (including surface debris capture), discourages travel onto adjacent private lands, and displays County code and contact information to Proposed Project users at each Reservoir surface (McCloud, Iron Canyon, Pit 6 and Pit 7).

- Construction and Reconstruction for Recreation: Construction and reconstruction of several recreational facilities near McCloud Reservoir, McCloud River below McCloud Dam, Iron Canyon Reservoir, Pit 6 Reservoir, and Pit 7 Reservoir and Afterbay (described in more detail in Section 3.2.4).

PG&E would be required to provide water level information for McCloud and Iron Canyon Reservoirs to the public to inform visitors when conditions are suitable for launching boats. PG&E would also be required to provide real-time water flow information on the internet (gage MC-1 at Ah-Di-Na) for the McCloud River below McCloud Dam to inform the public when water flows are suitable for whitewater boating. PG&E has implemented this measure to provide real-time public flow information, which is available at the California Data Exchange Center webpage for MC-1: http://cdec.water.ca.gov/dynamicapp/staMeta?station_id=MCA.

3.1.8.8 Road and Transportation Facility Management Plan

USFS Final Section 4(e) Condition 29 requires the development of a Road and Transportation Facility Management Plan. The Road and Transportation Facility Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification, and describes the scope of road maintenance, improvements, and monitoring needed to meet new license conditions, and USFS RMOs and traffic service levels applicable to Proposed Project roads. Under Condition 29 in the USFS Final Section

4(e) Conditions, the Road and Transportation Facility Management Plan will include, but may not be limited to the following components:

- Planning and Inventory: A map(s) compatible with USFS Travel Management Routes and GIS database showing all Proposed Project roads and associated road signs within, adjacent, or specific to the Proposed Project boundary.
- Operation, Maintenance, and Road-Associated Debris: An annual road operation and maintenance schedule for Proposed Project roads that complies with USFS standards, RMOs, BMPs, Limited Operating Periods, and USFS Travel Management Rule.
- Construction and Reconstruction for Roads: Construction and reconstruction implementation schedule to bring existing roads and associated facilities into compliance with USFS standards (including RMOs and the USFS Travel Management Rule).
- Monitoring: Conduct periodic traffic use surveys and periodic road capacity reviews. If the USFS determines roads no longer meet the RMOs, define actions and timelines to correct deficiencies.

3.1.8.9 Sign and Interpretive/Education Plan

USFS Final Section 4(e) Condition 31 requires the development of a Sign and Interpretive/Education Plan. The Sign and Interpretive/Education Plan has been incorporated into the Proposed Project submitted to the SWB for certification and establishes overall design guidelines and maintenance standards for existing and Proposed Project-related signs and will also enhance public understanding of Proposed Project- affected resources through interpretive and educational measures. These signs, collectively referred to as “Project-Related Signs”, include signs related to information, direction/orientation, FERC, safety, fire and fire prevention, recreation, cultural and other resources, interpretive and education, and web media. Under condition 31 in the USFS Final Section 4(e) Conditions, the Sign and Interpretive/Education Plan will include, but may not be limited to the following components:

- Inventory of all existing informational, FERC, safety, directional, recreation, interpretive, and education (all non-road or traffic) signs within the Proposed Project area or associated with Proposed Project facilities.
- Collaborative development of standards, designs, and locations for all Project-Related Signs (existing and new), including web media.
- Protocols for installing, maintaining, and monitoring Project-Related Signs for the life of the license.

The Project-Related Signs pertain directly to Proposed and Hydroelectric Project facilities, use, amenities or opportunities and may be located within the Proposed Project area, on Proposed Project roads, on USFS lands, or along roads external to the Proposed Project area. The only signs not addressed in this Plan are road and traffic-related signs associated with roads external to recreation sites. Traffic-related signs are included in the Road and Transportation Facility Management Plan.

3.1.8.10 Terrestrial Biological Management Plan

USFS Final Section 4(e) Condition 26 requires the development of a Terrestrial Biological Management Plan. The Terrestrial Biological Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification, and outlines the specific tasks, components, and products for

monitoring and surveying terrestrial wildlife species on Proposed Project lands and USFS lands potentially affected by the Proposed Project and specifies the measures to protect both the species and their habitat. Special status wildlife species potentially affected by Proposed Project activities include those that are federally threatened, endangered or proposed, and those categorized as USFS-sensitive species, including those listed for Survey and Manage, state-listed as endangered, California threatened, California species of special concern, or California fully protected species. Preconstruction monitoring and survey results will be used to determine whether Proposed Project-related activities could impact these special status species or their habitat, and if there is a need to adjust environmental components specified in the license. The list of special- status species will be reviewed annually and updated as needed to include newly listed or remove delisted species. Under condition 26 in the USFS Final Section 4(e) Conditions, the Terrestrial Biological Management Plan will include, but may not be limited to the following components:

- Periodic surveys (including pre-disturbance/preconstruction)
- Occupation and population monitoring
- Species specific mitigation measures (including avian collision and electrocution hazard prevention measures)
- GIS mapping and reporting

Species to be monitored include terrestrial mollusks, Shasta salamander, western pond turtles, northern goshawk, bald eagles, peregrine falcon, northern spotted owl, willow flycatcher, special status bats, neo-tropical birds, and forest carnivores. Additional species may be added in the future if required by law or regulation, and if suitable habitat occurs within the Proposed Project or Proposed Project-affected area. Surveys for valley elderberry longhorn beetle will occur under the Vegetation and Invasive Weed Management Plan and are habitat-only surveys.

3.1.8.11 Vegetation and Invasive Weed Management Plan

USFS Final Section 4(e) Condition 25 requires the development of a Vegetation and Invasive Weed Management Plan. The Vegetation and Invasive Weed Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification and will establish overall management and monitoring actions to protect and encourage native vegetation establishment on Proposed Project-affected lands, minimize invasive weeds, and manage vegetation that affects Proposed Project facilities. Under condition 25 in the USFS Final Section 4(e) Conditions, the Vegetation and Invasive Weed Management Plan will include, but may not be limited to the following components:

- Protection of special status and revegetation source populations;
- Invasive species management and monitoring, including an adaptive management element to implement methods for prevention of aquatic invasive weeds, as necessary;
- Revegetation implementation and monitoring;
- Treatment protocols for vegetation management and hazard reduction for protection of Proposed Project facilities and Proposed Project-affected resources within the Proposed Project-affected area;

- Pesticide/herbicide use approval and restrictions; and
- Botanical enhancements for specific special status wildlife species.

In addition, the Vegetation and Invasive Weed Management Plan will include an adaptive management element which may include, but may not be limited to, public education and signing of public boat access and preparation of an Aquatic Plant Management component of the plan. The Vegetation and Invasive Weed Management Plan will not address Proposed Project-related vegetation management treatment for vehicular sight distance, which is addressed in the Road and Transportation Facility Management Plan, or fuels treatments around Proposed Project facilities, which is contained in the Fire and Fuels Management Plan.

3.1.8.12 Visual Quality Management Plan

USFS Final Section 4(e) Condition 32 requires the development of a Visual Quality Management Plan. The Visual Quality Management Plan is not considered a standard "plan," but rather is a list of measures and a timeline to implement the measures since there is general agreement between PG&E and the USFS that specific measures are known and understood. The Visual Quality Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification and will be implemented to meet USFS Visual Quality Objectives to assure Propose Project-affected resources that are on or affecting USFS lands blend with the natural environment.

The goal of the Visual Quality Management Plan is to comply with laws, standards, and USFS policy for visual (scenery) management, including the Shasta-Trinity Land and Resource Management Plan's guidance for "sensitive viewing areas." The Visual Quality Management Plan will address operation and maintenance of existing facilities, reconstruction of existing facilities, and construction of new facilities. In addition, PG&E will be required to provide updated photo at key observation points. Under condition 32 in the USFS Final Section 4(e) Conditions, the Visual Quality Management Plan will include, but may not be limited to the following components:

- Operation and maintenance of existing facilities
- Reconstruction or repair of existing facilities
- Construction of new facilities
- Key observation point monitoring

In addition, several of the other plans described above will provide information related to implementation of the Visual Quality Management Plan, including the Recreation Development and Management Plan, Sign and Interpretation/Education Management Plan, Fire and Fuels Management Plan, Vegetation and Invasive Weed Management Plan, Road and Transportation Facilities Management Plan, and Erosion and Sediment Control Management Plan.

3.1.8.13 Water Quality and Temperature Monitoring Plan

USFS Final Section 4(e) Condition 20 Water Quality and Temperature Monitoring Plan and SWB Final 401 Condition 3, Water Quality Monitoring and Management, require the development of a plan with requirements that focus on aquatic habitats and water-based recreation on USFS lands. The Water

Quality and Temperature Monitoring Plan has been incorporated into the Proposed Project and submitted to the SWB for certification. PG&E's license application included a proposed draft Water Quality Monitoring Plan to identify potential Proposed Project impacts on water quality. Under condition 20 in the USFS Final Section 4(e) Conditions and SWB 401 Condition 3, Water Quality Monitoring and Management, the Water Quality and Temperature Monitoring Plan will include, but may not be limited to the following components:

- Monitoring all Proposed Project reservoirs every five years for contaminants at appropriate key recreation locations (e.g. boat ramps, day use areas, near campgrounds), including *E.coli*, to measure possible sanitation concerns.
- Periodic monitoring of dissolved oxygen at McCloud, Pit 6 and Pit 7 Reservoirs.
- Temperature monitoring from May 1 through September 30, at a minimum, for a period of ten years following implementation of the new license instream flow schedule. Monitoring to be conducted by Proposed Project segments (i.e., reservoirs and Proposed Project-affected rivers) are subject to the following:
    - Permission to enter private lands during sensor installation/maintenance, as applicable.
    - Routine sensor maintenance or deployment in the spring may be delayed due to late snows or high flows and will be initiated as early in May as possible, subject to safety and access constraints.
    - If monitoring indicates that temperatures above 20°C are occurring within the Proposed Project reservoirs or downstream reaches, additional monitoring may be required.
- Continuous monitoring of turbidity for the term of the license in the Lower McCloud River (at MC-7 or MC-1) during fishing season (approximately April 25 to November 15) to record elevated turbidity for recreational use.
    - Routine sensor maintenance or deployment in the spring may be delayed due to late snows or high flows and will be completed prior to or as early in the fishing season as possible, subject to safety and access constraints.
    - Turbidity levels will be available real-time during the fishing season on the PG&E's public Proposed Project website.
- Turbidity monitoring during construction, reconstruction, or other soil disturbing activities to identify point source erosion that may require repair or stabilization.
    - Continuous monitoring of turbidity for a minimum of five years after license acceptance in Iron Canyon Creek (at MC-10) to ensure that PG&E's repairs have reduced sedimentation into the creek below the dam. If elevated turbidity (above Basin Plan levels) is still occurring after five years, continue monitoring for an additional five years until additional mitigations reduce turbidity to or below Basin Plan levels. If, before the end of five years, PG&E proposes and the USFS and other applicable conditioning agencies agree and approve that PG&E's erosion control repairs have effectively reduced

sedimentation and turbidity below the dam, then turbidity monitoring at this location can cease.

- Implementation of BMPs, or the most current USFS regulations, within the Proposed Project and Proposed Project-affected area that will satisfy the Aquatic Conservation Strategy Objectives within the Northwest Forest Planning area, and govern implementation of:

- Proposed Project operation and maintenance activities.
- Proposed Project construction, reconstruction, and repair of Proposed Project sites.
- Developed and dispersed recreation use.
- Road use, routine maintenance, reconstruction and repair.
- Vegetation manipulation.
- Prescribed fire and wildland fire planning and fire suppression.
- Watershed practices.

3.1.8.14 Water Flow Requirements

The current license for the Hydroelectric Project includes MIF requirements for McCloud River and Iron Canyon Creek below their respective dams (Article 31). For the McCloud River below the McCloud Dam, requirements include a MIF release of 50 cfs from May through November, and 40 cfs from December through April, as measured at gage MC-7. Stream flows in addition to the MIF requirements are determined by month and water year type, and are released as necessary to maintain the 160 to 210 cfs that is required at gage MC-1, which is located below the confluence of Hawkins Creek and the McCloud River (FERC 2011).

Flows of at least 3 cfs are required to be released to Iron Canyon Creek below Iron Canyon Dam at all times. A minimum of 150 cfs is required on the McCloud River below the Pit 7 Powerhouse whenever the surface water elevation of Shasta Lake is below the invert elevation (or bottom) of the draft tubes of the powerhouse (1,055 feet msl) (FERC 2011).

To facilitate use of the boat ramp during the recreation season from May 15 to October 15, PG&E voluntarily keeps the water surface elevation of Iron Canyon Reservoir at or above elevation 2,615 feet msl, instead of the minimum elevation of 2,593 feet msl allowed by the current license.

3.2 PROPOSED PROJECT

A project is defined under CEQA as “the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment” and that requires a discretionary approval from a public agency. (Cal. Code Regs., tit. 14, § 15378, subd. (a)(3).)The Proposed Project evaluated in the 2019 IS/ND remains the underlying project for purposes of this SEIR; however, this SEIR focuses on new information since adoption of the IS/ND and evaluates whether those changes would result in new or additional environmental impacts. For purposes

of this SEIR, the proposed project components evaluated consist of the following existing elements and modifications:

- The existing Hydroelectric Project operations and maintenance of infrastructure.
- Construction of recreational facility improvements and continued operation of the recreational facilities.
- Increased MIF releases for two Proposed Project-affected stream reaches:
  - (1) the McCloud River below McCloud Dam.
  - (2) Iron Canyon Creek below Iron Canyon Dam.
- MIF releases to protect water quality and support the designated beneficial uses of these stream reaches (CVRWQCB 2018, Basin Plan Table 2-1); Implementation of the USFS Final 4(e) Conditions, including 13 monitoring and management plans. Under the Proposed Project, and as required by USFS Final 4(e) Conditions, PG&E would comply with each of the conditions (e.g., MIFs releases) and develop and implement 13 resource management plans. These are described in Section 3.1.8 Existing Environmental Components. All USFS plans will require FERC approval prior to implementation.
- Implementation of the SWB issued water quality certification conditions (with the exception of Condition 10 Whitewater Recreation) to reduce impacts to water quality and beneficial uses in the Proposed Project area (Section 3.1.8 Previously Adopted Environmental Components).

In addition, as described in Chapter 2, Introduction, this SEIR evaluates alternatives and new information associated with the Proposed Project as part of the subsequent environmental review:

- Alternatives to the Proposed Project, including increased whitewater boating flows required by the certification Condition 10 and increased MIFs to support winter-run Chinook salmon spawning.
- Incorporation of new information related to TCRs.

3.2.1 Powerhouses

In PG&E's license application, dated July 2009, PG&E proposed two new hydropower developments: (1) the McCloud Development, which would consist of a new powerhouse below McCloud Dam that would use water stored in McCloud Reservoir; as well as an associated transmission line that would be routed from the new McCloud powerhouse to the town of McCloud in Siskiyou County; and (2) the Pit 7 Afterbay Development, which would consist of a new powerhouse below the Pit 7 Afterbay Dam that would use water released from Pit 7 Afterbay; as well as an associated transmission line that would be routed from the new Pit 7 Afterbay Powerhouse to the existing Pit 7 Switchyard near Pit 7 Dam.

PG&E, however, did not finalize designs or capacities for the two proposed hydropower developments in their license application. PG&E stated in their license application that the economic feasibility of the two proposed hydropower developments depends in part on conditions included in the new Proposed Project license (i.e., new minimum instream requirements). As a result, PG&E will wait until they receive the new FERC license for the Proposed Project before they determine if the two hydropower developments will be built. Therefore, the Proposed Project addressed in this Draft SEIR does not include these two proposed hydropower developments.

If PG&E decides to build the two proposed hydropower developments after the issuance of a new license by FERC, then PG&E would need to request an amendment to the certification for the Proposed Project. An amendment to the certification to incorporate the development of two new hydropower facilities in the Proposed Project would require compliance with CEQA.

3.2.2 Project Purpose and Objectives

The SWB has identified the following Proposed Project objectives, as required under CEQA Guidelines, section 15124(b):

1. Improve the long-term water quality conditions associated with the Proposed Project in the watersheds located within the Proposed Project area including (1) McCloud Reservoir, (2) Lower McCloud River, (3) Iron Canyon Reservoir, (4) Lower Iron Canyon Creek, (5) Upper Pit River, and (6) Lower Pit River.

To receive a new FERC license, PG&E is required to obtain a certification under Section 401 of the CWA. The SWB is the agency in California that is responsible for acting on applications for certification. The purpose of a certification is to protect the waters of the United States by ensuring waste discharged to waters from a proposed activity meet water quality standards presented in the Basin Plan (CVRWQCB 2018). The Basin Plan identifies the beneficial uses and water quality objectives for water bodies within this geographic region. Identified beneficial uses for the McCloud River include municipal and domestic water supply; power (generation); water contact recreation; canoeing and rafting (potential beneficial use); other non-contact recreation; cold freshwater habitat; cold spawning habitat; and wildlife habitat. The beneficial uses for the Pit River (downstream of the confluence of Hat Creek to Shasta Lake) include all those listed for the McCloud River and additionally: agricultural supply (irrigation, stock watering); canoeing and rafting; warm freshwater habitat (potential beneficial use); and warm spawning habitat (potential beneficial use).

2. Protect aquatic resources in Proposed Project-affected stream reaches.
3. Protect and enhance natural and cultural resources in the Proposed Project area by implementing 13 environmental management and monitoring plans.
4. Improve recreational access and facilities at McCloud Reservoir, Iron Canyon Reservoir, and Pit 7 Afterbay.

3.2.3 Proposed Project Boundary

The Proposed Project includes expansion of the existing FERC boundary by 1.88 acres to accommodate expansion of an existing access road to Hawkins Landing Campground. All other Proposed Project improvements would occur within the existing FERC boundary.

In addition, in 2017, PG&E proposed as a separate project an adjustment to the FERC boundary of an additional 1.41 acres to accommodate realignment of the Pit 7 Access Road, which provides access to Pit 7 Dam and Powerhouse. The original Pit 7 Access Road failed in 2017 due to winter storms and landslides and, in order to re-establish access, PG&E repaired and realigned the road along a less steep slope to reduce the likelihood of road damage in the future.

3.2.4 Proposed Recreation Facilities

The Proposed Project includes construction of four new recreation facilities at McCloud Reservoir, two new recreation facilities at Iron Canyon Reservoir, one new recreation facility at Pit 6 Reservoir, and two new recreation facilities at Pit 7 Afterbay.

In addition, the Proposed Project includes recreation improvements at McCloud Reservoir, Iron Canyon Reservoir, and Pit 7 Afterbay. Table 3-3 lists the recreation facilities, number of workers, duration and types of equipment necessary to construct the facilities, and total amount of disturbed acreage per facility. Figure 3-1, Figure 3-2, and Figure 3-4 provide the locations of the facilities. Changes at each facility are described in the following sections.

Table 3-3. Proposed Project Recreation Facilities: Construction Personnel, Duration, Equipment List, and Disturbed Acreage

Project Changes	Recreational Facility	Work Crew	Duration (Days)	Equipment	Disturbed Area (acres)
McCloud Reservoir					
Improved	Tarantula Gulch Boat Launch and Day Use Area	14	60	Concrete mixer truck, power screed, drill rig	2.6
New	McCloud Day Use Area	7	15	Drill rig	<1
New	Red Banks Day Use Area	7	30	No additional equipment required.	<1
New	Battle Creek Shoreline Access	7	10	No additional equipment required.	<1
New	McCloud Reservoir West Dam Shoreline Access	7	10	No additional equipment required.	<1
New	McCloud Reservoir East Dam Shoreline Access	7	10	No additional equipment required.	<1
New	Star City Campground and Day Use Area	16	65	Concrete Mixer Truck, Drill Rig for Well, Grader, Front End Loader, Drum Roller, Backhoe, Three Crew Trucks	13.6
New	McCloud Dam River Access	7	20	No additional equipment required.	<1
Iron Canyon Reservoir					
Improved	Hawkins Landing Boat Launch	10	40	Concrete Mixer Truck, Power Screed	1.7
Improved	Hawkins Landing Campground	10	60	Drill Rig, Mixer Truck	5
Improved	Deadlun Campground	10	60	Drill Rig, Mixer Truck	9.8
New	Gap Creek Campground	20	40	Drill Rig, Mixer Truck, Power Screed, Drum Roller, Paver, Grader, Loader, Drum Roller, Two Backhoes	6.5

Project Changes	Recreational Facility	Work Crew	Duration (Days)	Equipment	Disturbed Area (acres)
New	Iron Canyon Dam Boat Launch and Day Use Area	12	60	Drill Rig, Mixer Truck, Power Screed, Drum Roller, Paver, Backhoe, Grader	2.9
New	Three shoreline access parking areas and trails at Iron Canyon	5	12	No additional equipment required.	<1
Pit 7 Reservoir					
New	Upper Pit 7 Reservoir Trailheads	5	8	No additional equipment required.	<1
New	Lower Pit 7 Reservoir Shoreline Access	7	35	No additional equipment required.	<1
Pit 7 Afterbay					
Improved	Fenders Flat Day Use Area	12	30	Mixer Truck	2.25

Note: Each recreational area will have a baseline equipment list including: grader, dozer, front end loader, backhoe, excavator, dump truck, 3-crew trucks, plate compactor, drum roller, paver. Additional equipment needs for each area are listed above.

In general, nine of the 17 facility improvements would each disturb less than one acre. The largest area of disturbance, Star City Campground and Day Use Area, would encompass approximately 13.6 acres. The total disturbance for all new and improved facilities would be approximately 48 acres. No additional laydown areas would be needed to construct any of the facilities.

During construction of the recreation facility improvements, usable excess construction materials such as lumber, paint, metal pipe, etc. would be returned to the PG&E Service Center for use on other projects. Waste would be disposed of at local waste transfer stations or Anderson Solid Waste Landfill. Based on the number of facilities requiring improvement, the estimated volume of waste generated by construction would be 750 cubic yards (refer to specific facility descriptions below).

3.2.4.1 McCloud Reservoir

Recreation facilities, and associated improvements, surrounding the McCloud Reservoir are presented in Figure 3-1 and are described in more detail in the following sections.

Tarantula Gulch Boat Launch and Day Use Area

The total area disturbed by improvements to the Tarantula Gulch Boat Launch and Day Use Area would be approximately 2.6 acres, and the work would be accomplished by approximately 14 workers over 60 working days. Planned features of the Tarantula Gulch Boat Launch include a 30-foot-wide, two-lane, concrete boat ramp and a 4-foot- wide walkway. Improvements include extending the boat launch 4 feet in length to extend below the minimum reservoir pool elevation (2,634 feet) and installing an 8-foot by 40-foot sliding boarding float dock or pier.

The proposed improvements would also include:

- A new asphalt surfaced access road and parking area with a maximum of 12 pull-through car/trailer parking spaces.

- Ten head-in car/trailer parking spaces and six car parking spaces.
- Potable water supply.
- One sealed vault toilet.
- Day use area with three covered picnic sites.
- An access trail to the edge of the reservoir.
- An informational kiosk and pay station.
- Signage and site security lighting.

McCloud Day Use Area

The total area disturbed by improvements to the McCloud Day Use Area would be less than one acre, and the work would be accomplished by approximately seven workers over 15 working days. The proposed improvements include:

- An asphalt surfaced access drive.
- Parking area for five vehicles (with one Americans with Disabilities Act-compliant space.
- Five picnic sites (each with picnic table and barbecue/fire ring).
- A trail surfaced with natural materials leading to the reservoir shoreline.
- One sealed vault toilet.
- One potable water hydrant.
- One trash receptacle.
- Entry sign and informational kiosk.

Red Banks Day Use Area

The total area disturbed by improvements to the Red Banks Day Use Area would be less than one acre, and the work would be accomplished by approximately seven workers over 30 working days. The existing area is currently used for informal day use activities on the shoreline at McCloud Reservoir and would become a developed recreation site through the installation of picnic tables, a vault restroom, and a shoreline access trail. The shoulder of the USFS Road 38N11 is currently used for parking. The roads into this day use area would be re-graded, and bank stabilization measures would be necessary due to undercutting near the shoreline.

Battle Creek Shoreline Access

The total area disturbed by improvements to the Battle Creek Shoreline Access would be less than one acre, and the work would be accomplished by approximately seven workers over 10 working days. This existing shoreline access currently has an asphalt parking area and access to the water's edge along USFS Road FS-11. The parking area would be reorganized to encourage multiple user groups, and the trail would be surfaced with native materials.

McCloud Reservoir West Dam Shoreline Access

The total area disturbed by improvements to the McCloud Reservoir West Dam Shoreline Access would be less than one acre, and the work would be accomplished by approximately seven workers over ten working days. Improvements for this existing shoreline access would include improving the vehicle parking area and improving accessibility of the trail to the edge of the water by constructing new switchbacks.

McCloud Reservoir East Dam Shoreline Access

The total area disturbed by improvements to the McCloud Reservoir East Dam Shoreline Access would be less than one acre, and the work would be accomplished by approximately seven workers over ten working days. Improvements to this existing shoreline access would include parking area designation, improved vehicle access, and signage.

Star City Campground and Day Use Area

The total area disturbed by improvements to the Star City Campground and Day Use Area would be approximately 13.6 acres, and 16 workers would accomplish the work over 65 working days. The existing Star City dispersed camping area would be improved to include access road improvements, campsites, day-use area, and trails. The 2.6-mile access road, USFS Road S38N04Y, would be reconstructed.

Proposed improvements to Star City Campground would include:

- Up to ten walk-in campsites and a host site, with campsite features such as a table, a tent pad, and fire ring.
- Roads with vehicle barriers.
- Asphalt parking area.
- Camping spurs.
- One sealed vault toilet.
- Animal resistant trash enclosures.
- Message board and signage.
- Potable water source.
- Shoreline access paths.

River Access below McCloud Dam

The total area disturbed by improvements to the river access below McCloud Dam would be less than one acre, and approximately seven workers would accomplish the work over 20 working days.

Proposed improvements to this river access area would include:

- Improvements to the access road.
- Angler access trails.
- Compact aggregate parking area.
- One sealed vault toilet.
- Animal resistant trash receptacle.
- A put-in for white water boating.

3.2.4.2 Iron Canyon Reservoir

Recreation facilities and associated improvements surrounding Iron Canyon Reservoir are presented in Table 3-3 and Figure 3-2 and are described in more detail in the following sections.

Hawkins Landing Boat Launch

The total area disturbed by improvements to the Hawkins Landing Boat Launch would be approximately 1.7 acres, and approximately ten workers would accomplish the work over 40 working days. This existing

boat launch would undergo reconstruction that would consist of a concrete-surfaced and striped parking lot that has mix of single and double spaces with pull-through design for a minimum of ten vehicles with trailers above the reservoir high water level and adjacent to the existing ramp location. This boat ramp would be reconstructed to current Cal Boating standard (surface only) for a single lane ramp.

Hawkins Landing Campground

The total area disturbed by improvements to the Hawkins Landing Campground would be approximately five acres, and approximately ten workers would accomplish the work over 60 working days. This existing campground would undergo reconstruction which would include removing existing infrastructure, redesigning, and reconstructing the campground to consist of:

- An asphalt-surfaced road, with ten campsites plus one host site (each campsite would have a table, tent pads, asphalt-surfaced parking spurs and fire rings).
- Sealed vault toilets.
- Signage.
- Vehicle control barriers.
- A trail, surfaced with native materials, routed from the campground to the boat launch and potable water. Some vegetation would be removed to create views of the reservoir from the campsites near the shoreline.

Deadlun Campground

The total area disturbed by improvements to the Deadlun Campground would be approximately 9.8 acres, and approximately ten workers would accomplish the work over 60 working days. The existing campground footprint would remain the same. Currently, the campground has 27 campsites, including two multi-family sites.

Campsites would be improved to meet a recreational vehicle requirement of 16-foot width and include multi-family camping. For each campsite, a tent pad, a table, animal resistant food lockers and trash receptacles, and barbecue/fire ring would be added.

The campsite interior road would be re-graded with gravel, chip seal, asphalt surfaces, and circulation barriers to control vehicle access. Some vegetation removal would be conducted to open the view of the reservoir. In general, the campground would be re-graded to make campsites with flat areas more accessible. The shore access would also be redesigned and re-graded to provide a compacted aggregate surface trail six to eight feet wide along the shore, above the normal high-water line, and would allow for a continuous shoreline trail route from Deadlun Creek to Cedar Salt Log Creek (approximately 1.8 miles).

Gap Creek Campground

The total area disturbed by improvements to the Gap Creek Campground would be approximately 6.5 acres, and approximately 20 workers would accomplish the work over 40 working days. Proposed features for the new Gap Creek Campground include:

- Asphalt surfaced access loop roads to two campground areas.
- Asphalt parking area for seven walk-in campsites.
- An asphalt loop road and parking spurs for 11 campsites.
- Sealed vault toilets.
- Potable water supply.

- Picnic tables and barbecue/fire rings at each campsite.
- A host campsite.
- Animal resistant food lockers and trash receptacles.
- Compacted aggregate trails for shoreline access.
- Campground entry signs, information signage, and a pay station.
- Security lighting.

Iron Canyon Dam Boat Launch and Day Use Area

The total area disturbed by improvements to the Iron Canyon Dam Boat Launch and Day Use Area would be approximately 2.9 acres, and approximately 12 workers would accomplish the work over 60 working days. Proposed features for the new Iron Canyon Dam Boat Launch and Day Use Area include:

- A single lane concrete boat ramp constructed to Cal Boating standards with walkway and mid-ramp turn around extended to four feet below the minimum reservoir pool elevation.
- A sliding boarding float dock or pier.
- An asphalt surfaced access entry and parking area, with a minimum of 15 pull- through vehicle parking spaces (ten with trailers).
- A sealed vault toilet.
- Potable water supply.
- Animal resistant trash receptacle.
- Day-use area with five picnic tables and barbecue/fire rings.
- Facility entry sign.
- An informational kiosk.
- Security lighting.

Three Shoreline Access Areas at Iron Canyon Reservoir

The total area disturbed by development of three new shoreline access areas along Iron Canyon Reservoir would be less than one acre combined, and approximately five workers would accomplish the work over 12 working days. Suitable areas along the reservoir would need to be identified. These new shoreline access areas would include surfaced parking sites and shoreline access trails surfaced with native materials.

3.2.4.3 Pit 7 Reservoir

Recreation facilities and associated improvements surrounding Pit 7 Reservoir are presented in Figure 3-4 and are described in more detail in the following sections.

Upper Pit 7 Reservoir Trailheads

The total area disturbed by improvements to trailheads around the Upper Pit 7 Reservoir would be less than one acre, and approximately five workers would accomplish the work over eight working days. Two trailheads and trails, located approximately 0.25 and 0.6 miles downstream of the Pit 6 Dam, would be constructed along the Pit 6 Powerhouse Road to provide access to Pit 7 Reservoir. Improvements to the upstream trailhead would include providing parking along the shoulder of the road for about four vehicles and constructing a pedestrian access (that would be surfaced with native materials) on an existing access trail that is routed from Pit 6 Dam Access Road to the shoreline and which can be used as a hand-launch boat access trail.

Improvement to the downstream trailhead would include a surfaced parking area for a minimum of three vehicles and a new trail surfaced with native materials. This trail would require installing two culverts where the trail crosses stream drainages, and a foot bridge at Cape Horn Creek. This downstream shoreline access trail would provide a secondary location where boaters could exit the reservoir if the flows released from Pit 6 Powerhouse prevented boaters from traveling to the shoreline access provided at the upstream end of the reservoir.

Lower Pit 7 Reservoir Shoreline Access

The total area disturbed by a new shoreline access trial in the lower Pit 7 Reservoir would be less than one acre, and approximately seven workers would accomplish the work over 35 working days. A new shoreline access trailhead, trail, and a location for hand-launching boats would be constructed at the downstream end of Pit 7 Reservoir, just upstream of Pit 7 Dam. Proposed improvements include a surfaced vehicle access road and surfaced parking for a maximum of eight vehicles. The new parking area would include a new turnaround and gate to prevent public access to the dam and spillway. Shoreline access would be provided by constructing an 80-foot metal stairway that would connect the Pit 7 Dam Access Road to a new pedestrian trail (surfaced with native materials), which would extend 1,900 feet and terminate at the shoreline. The existing floating boom would be relocated to provide beach access that is outside the restricted access area near the dam.

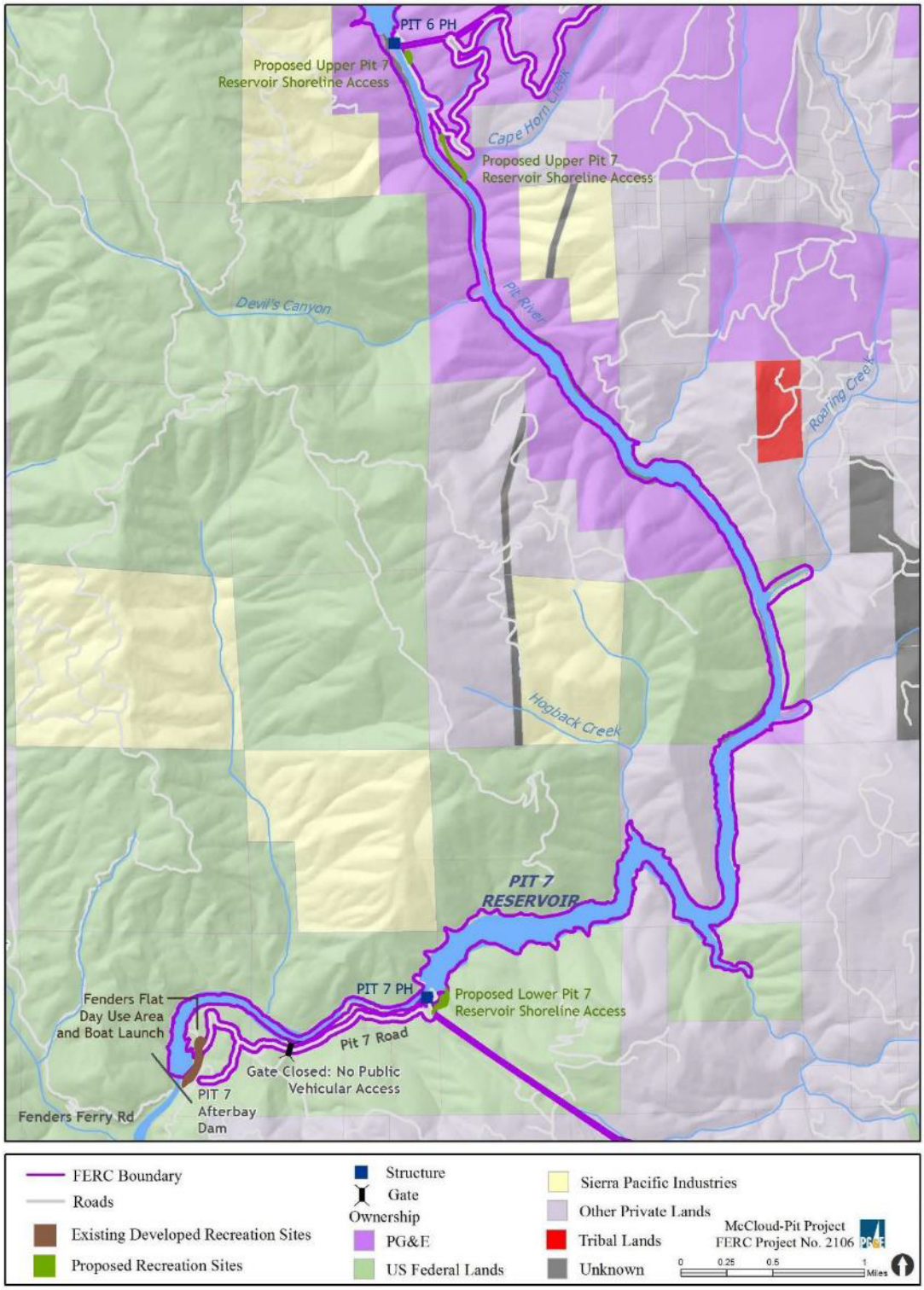


Figure 3-4. Recreation Facilities in the Vicinity of Pit 7 Reservoir

3.2.4.4 Pit 7 Afterbay

Fenders Flat Day Use Area

The total area disturbed by improvements to Fenders Flat Day Use Area would be approximately 2.25 acres, and approximately 12 workers would accomplish the work over 30 working days. This existing site is within Shasta–Trinity Recreation Area adjacent to the Pit 7 Afterbay Dam and includes an access road (FR 35N66) to the car-top boat launch, parking, and dispersed camping area surrounding the solar-powered, high water-flow warning tower. Site improvements would include a surfaced parking area, picnic tables, pedestal grill, potable water, and sealed vault toilet.

Vegetation in the area previously disturbed by off-road vehicle use would be restored by scarifying the disturbed areas and replanting with natural grasses. The access road to the day use area, which starts at USFS Road 35N23, is approximately 0.2 mile-long and would be re-graded and sloped.

3.2.5 Proposed Recreation Facility Operations and Maintenance

In addition to routine recreation facility operations and maintenance described in Section 3.1.6, the Proposed Project also includes an additional two to three caretakers at Iron Canyon Reservoir and one to two additional caretakers at McCloud Reservoir. In addition to being responsible for operations and maintenance at the recreation facilities where they are located, the caretakers would also be responsible for other nearby recreation facilities such as day use and shoreline access areas. The exact details of the how the Proposed Project recreation facilities would be operated and maintained will be developed after the license is issued and during the finalization of the Recreation Management Plan.

3.2.6 Proposed Minimum Instream Flows

Overall, the Proposed Project would increase MIF releases from McCloud and Iron Canyon Dams into their respective downstream reaches. PG&E proposes to continue to provide MIF releases of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is below 1,055 feet msl to maintain water flow in the Pit 7 Afterbay. The USFS Final Section 4(e) Condition 19 states that the 150 cfs would be year-round.

PG&E would release mean daily flows of a minimum of 175 cfs year-round from the McCloud Dam (as measured at PG&E gage MC-7), such that the mean daily flow at Ah- Di-Na (PG&E gage MC-1) is at a minimum of 200 cfs. Flows would be augmented during the period of February 15 through August 31, as described in Table 3-4. PG&E would implement the MIF release schedule for Iron Canyon Creek below Iron Canyon Dam as described in Table 3-5 (see also USFS Final Section 4(e) Condition 19 Minimum Streamflow Requirements and Measurement, and SWB Condition Minimum Instream Flows and Ramping Rates).

Table 3-4. Proposed Project Minimum Instream Flow from McCloud Dam into the McCloud River

Month	Lower McCloud River MIF by Water Year Type[a]	Net Change in Flow from Year-Round Minimum
Year-round minimum	Release ≥ 175 cfs at McCloud Dam (MC-7); and Maintain ≥ 200 cfs at Ah-Di-Na (MC-1)	Release ≥ 175 cfs at McCloud Dam (MC-7); and Maintain ≥ 200 cfs at Ah-Di-Na (MC-1)
	If the February 1 McCloud Runoff Percentage[b] is:	*Then change in flow will be:*

Month	Lower McCloud River MIF by Water Year Type[a]	Net Change in Flow from Year-Round Minimum
Feb 15–29	0-75%	No flow change
Feb 15–29	76-89%	No flow change
Feb 15–29	90-99%	Increase flow by 75 cfs at MC-7
Feb 15–29	100-119%	Increase flow by 125 cfs at MC-7
Feb 15–29	≥120%	Increase flow by 175 cfs at MC-7
Mar 1–15	0-75%	No flow change
Mar 1–15	76-89%	Increase flow by 50 cfs at MC-7
Mar 1–15	90-99%	Increase flow by 50 cfs at MC-7
Mar 1–15	100-119%	Increase flow by 100 cfs at MC-7
Mar 1–15	≥120%	Increase flow by 150 cfs at MC-7
	If the March 1 McCloud Runoff Percentage[c] is:	*Then change in flow will be:*
Mar 16–31	0-75%	No flow change
Mar 16–31	76-89%	No flow change
Mar 16–31	90-99%	Increase flow by 50 cfs at MC-7
Mar 16–31	100-119%	Increase flow by 50 cfs at MC-7
Mar 16–31	≥120%	Increase flow by 150 cfs at MC-7
Apr 1–15	0-75%	No flow change
Apr 1–15	76-89%	No flow change
Apr 1–15	90-99%	No flow change
Apr 1–15	100-119%	Increase flow by 50 cfs at MC-7
Apr 1–15	≥120%	Increase flow by 50 cfs at MC-7
	All Water Year Types	
Apr 16–Jun 30	If flow releases are ≥ 200 cfs on April 15 at MC-7	Then decrease flow at MC-7 by 50 cfs each Friday after April 15 until flow is 200 cfs.
Apr 16–Jun 30	If flow releases are < 200 cfs on April 15 at MC-7	Then release 175 cfs at MC-7; and maintain a minimum of 200 cfs at Ah- Di-Na (MC-1)
Jul 1–Aug 31	Release 175 cfs at MC-7; and Maintain a minimum of 215 cfs at Ah- Di-Na (MC-1)	Release 175 cfs at MC-7; and Maintain a minimum of 215 cfs at Ah- Di-Na (MC-1)
Sep 1–Feb 15	Release 175 cfs at MC-7; and Maintain a minimum of 200 cfs at Ah- Di-Na (MC-1)	Release 175 cfs at MC-7; and Maintain a minimum of 200 cfs at Ah- Di-Na (MC-1)

Notes:
[a] Using most recent California Department of Water Resources (DWR) Sacramento Valley Water Year Type Index forecast.
[b] February 1 runoff (RO) percentage from DWR Bulletin 120 for McCloud River above Shasta Lake.
[c] March 1 RO percentage from DWR Bulletin 120 for McCloud River above Shasta Lake.

Table 3-5. Proposed Project Minimum Instream Flows from Iron Canyon Dam into Iron Canyon Creek (cfs)

Month	Below Normal, Dry, Critically Dry	Above Normal	Wet
October	7	7	10
November	7	7	10
December	7	10	15
January	7	10	15
February	7	10	15
March	10	15	≥ 20*
April	10	15	≥ 20*
May	7	10	15
June	7	10	15
July	7	7	10
August	7	7	10
September	7	7	10

Notes:
* In March and April of Wet Water Year Types, the flow control valve on Iron Canyon Dam shall be fully opened. Mean daily flow shall be at a minimum 20 cfs during this period.

In addition, the Proposed Project would implement the following measures:

- Ramp down all spill events that are operationally controllable at McCloud Dam by valve operation at a maximum rate of 150 cfs per 48 hours until the prescribed MIF value is reached; and ramp up operationally controllable spills at McCloud Dam at a maximum rate of 200 cfs per 24-hour period.
- When testing the flow valve at Iron Canyon Dam, ramp up and ramp down at a maximum rate of 20 cfs increments.
- Determine water year type based on “Percent of Average, April through July Forecast” for the McCloud River above Shasta Lake, as provided by California DWR Bulletin 120 or its successor.

3.2.7 Proposed Project Schedule

The only new physical components of the Proposed Project are the proposed new and improved recreation facilities (refer to Table 3-3). Construction of the proposed recreation facilities would be scheduled for the months of August, September, October, and November, depending on location (refer to Table 3-3). This construction period is required to comply with limited operating periods for protection of wildlife species.

Construction would be scheduled after issuance of the new FERC license and is contingent on FERC approving the Recreation Development and Management Plan.

3.2.8 Alternatives Evaluated in this SEIR

This SEIR evaluates three alternatives—the No Project Alternative, Alternative 1 (Whitewater Boater Flows), and Alternative 2 (Salmon Flows below McCloud Dam)—that vary in the extent to which project operations are modified to address environmental objectives. The analysis focuses only on the resource areas potentially affected by the alternatives presented in this section. Chapter 5, Alternatives Summary, provides a summary of the alternatives analysis and identifies the Environmentally Superior Alternative.

3.2.8.1 No Project Alternative

The No Project Alternative would result in the State Water Resources Control Board not issuing the proposed water quality certification, and the McCloud-Pit Hydroelectric Project would continue operating under its existing FERC license and annual extensions. Current operations, maintenance, recreation facilities, and minimum instream flow requirements would remain unchanged. There would be no construction of new or improved recreation facilities, no increases to minimum instream flows for aquatic habitat enhancement, whitewater boating, or water quality improvement, and none of the additional environmental management or monitoring plans associated with the Proposed Project would be implemented.

The physical and operational conditions would largely remain as they are, with continued coordinated operation of McCloud and Iron Canyon Reservoirs focused on power generation while meeting existing minimum instream flow requirements. Recreation facilities would continue to operate and be maintained at current levels, and environmental protection measures and monitoring required under the current FERC license would persist. However, the No Project Alternative would not implement the proposed environmental management and monitoring plans, including aquatic biological monitoring, sediment management, recreation development, vegetation management, or enhanced water quality monitoring. The overall result is a continuation of the status quo, without the improvements or enhancements outlined in the Proposed Project.

3.2.8.2 Alternative 1 Whitewater Boater Flows

This alternative mirrors the Proposed Project in all respects except for the volume of whitewater boating flow releases below McCloud Dam. It incorporates all elements of the Proposed Project but enhances whitewater recreation opportunities by providing higher boating flows. Instead of PG&E's proposed 300 cubic feet per second (cfs) for 11 days annually (May 15 – June 15), the alternative evaluates increased flow releases—specifically, 500 cfs for 11 days per year and an expanded range of 500 to 900 cfs for whitewater boating events. These flows would be released during the spring high flow season, coordinated with minimum instream flow requirements and operational constraints to ensure suitability for recreational use. The timing of releases is designed to precede foothill yellow-legged frog breeding, thereby avoiding impacts during summer and early fall low-flow periods. To protect aquatic species, the flow releases would include a controlled down ramping rate, not exceeding an average of 1 inch per hour at the Ah-Di-Na gage (McCloud R A Ah-Di-Na nr McCloud, CA) in 6-hour increments, reducing the risk of fish stranding. All other aspects of the Proposed Project would remain unchanged under this alternative. As such, the only difference this Alternative and the proposed project is the inclusion of Water Quality Certification Condition 10.

Rationale

Water quality certification Condition 10, Whitewater Recreation requires PG&E to develop a Whitewater Plan with the primary goal of identifying whitewater recreation flows that provide adequate boating

opportunities on the McCloud River. To address the potential impacts of implementing Condition 10, this SEIR compares PG&E's whitewater boating proposal (300 cfs for 11 days) to the higher boating flows (500 cfs for 11 days) identified in the rationale for water quality certification Condition 10. In addition, the SWB developed a higher potential range of whitewater boating flows of 500 cfs to 900 cfs that may be appropriate for the protection and enhancement of whitewater recreation and aquatic resources.

3.2.8.3 Alternative 2 - Salmon Flows below McCloud Dam

Alternative 2 modifies the McCloud-Pit Hydroelectric Project by changing MIFs requirements below McCloud Dam to facilitate the potential reintroduction of salmonids, specifically winter-run and spring-run Chinook salmon, as well as steelhead. This approach seeks to provide appropriate habitat conditions for holding, spawning, incubation, and rearing, primarily by ensuring cooler water temperatures and higher flows during key periods.

Current Forest Service 4(e) MIFs are suitable for rainbow and brown trout but may not meet the needs of reintroduced winter-run Chinook salmon, which require water temperatures below 12–13°C for successful spawning and incubation. On the Sacramento River, winter-run Chinook salmon spawn in June and July, with eggs incubating through September and October. Elevated summer temperatures above 12°C increase mortality for salmon eggs and alevins.

The NMFS has assessed both upper and Lower McCloud River as having strong potential for winter-run Chinook salmon spawning. However, water temperature during summer remains a critical limiting factor. Under current 4(e) flows, summer releases at Ah-Di-Na United States Geological Service (USGS) Gage No. 11367800 would be 200 cubic feet per second (cfs), resulting in only a short river stretch (less than 4 miles) below 12°C in July. Historically, unimpaired flows at McCloud Dam exceeded 600 cfs, with median flows above 850 cfs, offering more optimal conditions.

Alternative 2 proposes increasing MIFs during June to a minimum of 250 cfs for improved spawning habitat and further boosting flows July through September to maintain water temperatures under 12°C for egg incubation. These flow targets are informed by NMFS recommendations and modeling studies by Nevares and Pawley (2009). These flows vary according to hydrologic and meteorological conditions and may be further refined through future modeling to meet temperature goals at river mile 12, near the Yét Atwam Creek confluence. In summary, Alternative 2 aims to balance hydropower operations with ecological restoration, providing the flows necessary for threatened salmon populations to thrive below McCloud Dam.

Rationale

The Forest Service Section 4(e) MIFs were developed to support resident rainbow and brown trout life stages but are not necessarily sufficient for reintroduced winter-run Chinook salmon, which have more stringent temperature and habitat requirements during spawning and incubation periods. Adult winter-run Chinook salmon currently arrive at Keswick Dam on the Sacramento River beginning in January or February and spawn primarily in June and July, with incubation occurring through September or October. During the summer incubation period, mortality increases when water temperatures exceed approximately 12°C. Under existing Forest Service Section 4(e) MIFs, summer flow releases below McCloud Dam would remain at approximately 200 cfs, resulting in sub-optimal spawning habitat and limited cold-water availability. Modeling based on median hydrology and meteorology indicates that, under these flows, less than four miles of river below McCloud Dam would remain below 12°C during July, the warmest month typically in a year.

Historically, unimpaired flows in the McCloud River at McCloud Dam were substantially higher than the Forest Service Section 4(e) MIFS, with minimum flows generally exceeding approximately 600 cfs and the median flows exceeding 850 cfs. Increasing summer MIFs under this alternative would partially restore flow conditions more consistent with the river's historical thermal and hydraulic regime, thereby expanding the extent and duration of suitable cold-water habitat for winter-run Chinook salmon spawning and incubation. This alternative is intended to address temperature-related limitations related to salmon reintroduction success consistent with NMFS Section 10(j) recommendations, while allowing for future refinement through adaptive management and modeling.

4 Environmental Setting, Impacts, and Mitigation Measures

4.1 INTRODUCTION

This chapter incorporates the Environmental Checklist contained in Appendix G of the CEQA Guidelines. Each resource topic section includes a description of the environmental setting, an explanation of the checklist's impact questions, and identification of the thresholds of significance for each question. In addition, each section describes Proposed Project components relevant to the section, including components proposed: (a) by PG&E in its license application; (b) in the terms and conditions contained in the FERC's final EIS, Appendix C – Commission Staff Recommended Conditions; and (c) in the United States Department of Agriculture – Forest Service (USFS) 4(e) Conditions; all of which have been incorporated into the Proposed Project that is before the SWB for certification. Refer to Chapter 2 for additional Proposed Project information. Effects of continuing Hydroelectric Project operations without implementation of the Proposed Project components are analyzed as the No Project Alternative pursuant to Section 15126.6(e)(3)(A) of the CEQA Guidelines.

The description of the existing environmental setting for each resource area relies largely on FERC's final EIS for the Proposed Project (FERC 2011), which is incorporated by reference. As needed, supplemental information and analysis of potential environmental impacts is provided herein to meet the requirements of CEQA.

4.2 RESOURCE AREAS NOT ADDRESSED IN THIS SEIR

The SEIR evaluates new information related to completing tribal consultation, the presence of winter-run Chinook salmon in the McCloud River and increased whitewater boating flows. The Proposed Project Description has not changed since the 2019 final IS/ND, including resource management plans and measures. While the IS/ND remains relevant and provides informational value regarding the environmental effects of the Proposed Project, preparation of a SEIR ensures that the new information is addressed through the CEQA process. The scope of this SEIR is therefore limited to resource areas for which substantial evidence indicates the potential for new or more severe impacts associated with revised flow operations, tribal cultural resources, and related changes, and does not reflect a reevaluation of the originally approved project description. As discussed in Sections 2.8 and 3.2.3, resource areas not reanalyzed in this SEIR are unaffected by these changes. The Final IS (State Clearinghouse No. 2019059010), to the extent it does not conflict with the additional information provided in this SEIR, remains valid and is incorporated herein by reference. The Final IS is available at: https://waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/mccloudpit_ferc2106.html.

The SWB determined that the following resource areas do not require separate analysis in this SEIR, though to ensure full consideration of potential impacts some impact areas (including aesthetics, noise, hazards/hazardous materials) are addressed in the discussion of TCRs or cumulative impacts.

- Aesthetics
- Agricultural and Forest Resources
- Air Quality
- Energy
- Geology and Soils

- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Transportation
- Utilities and Service Systems
- Wildfire

4.3 EVALUATION OF ENVIRONMENTAL IMPACTS

Each resource area is evaluated against the significance criteria provided by the 2025 CEQA Appendix G and each impact is assigned a level of significance. The varying levels of significance are defined as:

- **Potentially Significant Impact:** This level of significance is used for impacts that would exceed identified thresholds and where mitigation that would reduce the significant impact may not be available or feasible. Under this circumstance, an Environmental Impact Report is required.

- **Less than Significant with Mitigation Measures:** This level of significance is used for impacts that would meet or exceed the identified thresholds, but by implementing mitigation measures would reduce such impacts to less than significant.

- **Less than Significant:** This level of significance is used for impacts that would occur, but whose degree would not meet or exceed the identified thresholds.

- **No Impact:** This level of significance is used for impacts where no effect would occur and where it was clear the impact on a particular resource would be beneficial or neutral.

In the context of CEQA analysis of projects involving CWA Section 401 water quality certifications, mitigation measures not related to addressing water quality impacts cannot be imposed without agreement of the applicant. This SEIR identifies feasible mitigation measures and concludes that with implementation of those measures the Proposed Project will not result in significant impacts. If the applicant does not agree to implement all mitigation measures some impacts will remain potentially significant and the final SEIR will identify them as significant and unavoidable.

4.4 BIOLOGICAL RESOURCES

4.4.1 Environmental Setting

The Proposed Project is located along the western slope of the Cascade Range in the Central Valley of northern California, within Shasta County, Siskiyou County, and the Shasta-Trinity National Forest (STNF). The Proposed Project area originates at McCloud Reservoir and occupies the McCloud and Lower Pit River Basins to Shasta Lake. The area surrounding the Proposed Project is primarily federal forest land with rural communities and one larger incorporated city, Redding (>90,000 residents), nearby. Rivers and streams of the area are typically steep gradient and highly confined, resulting in minimal

floodplain development. The Proposed Project area is characterized by a variety of vegetation types typical of mixed woodland and mid-elevation forest habitats found in the southeastern Klamath Mountains and west-slope southern Cascade regions. More than three-quarters of the land is occupied by Douglas-fir–Ponderosa pine, Douglas-fir, and mixed conifer forests. The remaining land supports a wide array of vegetation types, where plant species diversity is high due to the complex topography of the area. In general, the topographical features preclude extensive wetland habitat, although wetland-associated vegetation often exists adjacent to and within the active river channel, and additional wetlands occur in small patches along the reservoirs.

Additional descriptions of aquatic resources, terrestrial resources, and threatened and endangered species in the Proposed Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.2—Aquatic Resources, Section 3.3.3—Terrestrial Resources, and Section 3.3.4—Threatened and Endangered Species.

4.4.1.1 Aquatic Resources

Aquatic Habitats

Aquatic habitats associated with the Proposed Project include major storage reservoirs (McCloud Reservoir and Iron Canyon Reservoir), two regulating reservoirs (Pit 6 and Pit 7 Reservoirs), and one afterbay (Pit 7 Afterbay). Proposed Project-affected stream reaches include the Lower McCloud River and Iron Canyon Creek. Each of these is briefly described below.

- McCloud Reservoir. At maximum storage pool, McCloud Reservoir has 520 surface acres and 14 miles of shoreline. Much of the shoreline around McCloud Reservoir is very steep and privately owned. Reservoir levels in McCloud Reservoir generally reach maximum elevations in late spring or early summer, followed by a sustained drawdown lasting through the summer and fall. The water temperatures and water quality conditions in the reservoir support a coldwater trout fishery.
- Iron Canyon Reservoir. At maximum storage pool, Iron Canyon Reservoir has 506 surface acres and 11 miles of shoreline. Five primary tributaries drain into Iron Canyon Reservoir and provide spawning and rearing habitat for trout. Water levels in Iron Canyon Reservoir generally reach maximum elevations in late spring or summer, followed by a sustained drawdown lasting through the summer and fall. The water temperatures and water quality conditions in the reservoir include a well-developed thermocline and a deep thermally stable hypolimnion, which supports a coldwater trout fishery.
- Pit 6 Reservoir. The Pit 6 Reservoir has a maximum storage capacity of about 15,619 ac-ft and a maximum surface area of about 268 acres, with ten miles of shoreline. Pit 6 Reservoir serves as the forebay for Pit 6 Powerhouse, and water surface elevation fluctuates daily. Littoral habitat is limited because of the steep topography of the channel and surrounding valley. Water temperature and water quality conditions support a transitional-zone fish assemblage (i.e., native foothill assemblage, or Sacramento pikeminnow/Sacramento sucker/hardhead assemblage). Pit 6 Reservoir is not stocked and receives relatively low angling pressure compared to McCloud and Iron Canyon Reservoirs because of limited accessibility by steep canyon walls and private property restrictions.
- Pit 7 Reservoir. Pit 7 Reservoir has a maximum storage capacity of 34,142 ac-ft and a surface area of about 468 acres at a normal maximum water surface elevation of 1,270 feet

msl. with 16 miles of shoreline. It is surrounded by steeply sloping, forested lands. Pit 7 Reservoir serves as the forebay for the Pit 7 Powerhouse, and water surface elevation fluctuates daily. The upper reaches of this reservoir provide riverine habitat, which shifts to lacustrine habitat for the majority of the length of the reservoir. Pit 7 Reservoir water temperature and water quality conditions support a transitional-zone fish assemblage. Pit 7 Reservoir is not stocked with trout and receives relatively low angling pressure compared to the McCloud River and McCloud and Iron Canyon Reservoirs, due to limited accessibility.

- Pit 7 Afterbay. Pit 7 Afterbay Dam creates a run-of-the-river afterbay approximately two miles long with an average surface area of 69 acres. The shoreline is generally steep and rocky, and the surrounding terrain is forested with the exception of a broad, shallow, vegetated littoral zone that occurs along the left bank in the vicinity of Fenders Flat near Pit 7 Afterbay Dam. Aquatic habitat within the upstream half of the afterbay is typically riverine, transitioning to more lacustrine habitat near the afterbay dam. The broad, shallow habitat near the afterbay dam includes submerged aquatic vegetation that provides refuge for larval and juvenile fishes and foraging habitat for juvenile and adult fishes.
- Lower McCloud River. The Lower McCloud River extends approximately 24 miles from McCloud Dam downstream to Shasta Lake. At its headwaters, the McCloud River is supplied by cold water springs that contribute to cool year-round water temperatures throughout the 24-mile-long reach. Proposed Project facilities at McCloud Dam regulate stream flow from the upper basin into the mainstem Lower McCloud River below the dam. The Lower McCloud River is fed by several tributaries, which cumulatively diminish the Proposed Project's influence on flow levels and aquatic resources moving downstream from McCloud Dam.
- Iron Canyon Creek. Iron Canyon Creek is a relatively short stream with a total length of 4.6 miles over an elevation range of 1,041 feet (4.3 percent average gradient), from 2,470 feet at Iron Canyon Dam to 1,430 feet at the confluence with Pit 6 Reservoir. Iron Canyon Creek receives water from Iron Canyon Reservoir, which receives water diverted from McCloud Reservoir and from a few small tributary streams. Iron Canyon Creek supports a self-sustaining population of rainbow trout. Iron Canyon Creek has relatively low angling pressure compared to McCloud River and Proposed Project reservoirs due to limited accessibility by the steep canyon and private property restrictions.

Turbidity and Water Temperature

Turbidity and water temperature are critical components of the aquatic habitat in the Lower McCloud River. McCloud Dam and Reservoir trap coarse sediment (>2 millimeters) delivered from upstream sources, limiting available gravel and coarse sediment that in an unregulated system would support and enhance aquatic habitat in the Lower McCloud River. LWD from the upper watershed accumulates in McCloud Reservoir during high flow events. Under the current license, PG&E generally removes LWD to protect the McCloud Dam structure. These active measures, as well as the dam itself, reduce the supply of LWD and impede the transport of LWD from the upper reaches of the McCloud River to the lower reaches of the river below McCloud Dam (FERC 2011).

The Lower McCloud River water temperature regime supports a viable trout fishery throughout the entire 24-mile-long reach and a Sacramento sucker/pikeminnow assemblage just above Shasta Lake; these species are typically associated with warmer foothill elevations and transitional-zone water temperatures. During the summer, the water temperature of the McCloud River entering into McCloud Reservoir is approximately 8°C. The water temperature of water released from McCloud Dam is approximately 10°C and water temperature warms downstream to approximately 16°C – 18°C near Shasta Lake (Table 4-1)

(Stillwater Sciences 2009, Figures F3-1, F3-2, and F3-3). The amount of warming is a function of the magnitude of summer flows released from the dam (Figure 4-2) (Nevares and Pawley 2009, Figures A3-1 through A3-9). During the summer, the flows released from the dam are 50 cfs or whatever flow is required to achieve 200 cfs at the downstream ah-Di-Na gage (Gage MC-1).

The major source of turbidity into McCloud Reservoir is volcanic sediment transported by Mud Creek from sources on Mt. Shasta (Nevares and Sagaves 2009). Suspended sediment, primarily originating in the area of the Mud Creek and Konwakiton glacier, produces periodic, large non-Proposed Project-related inputs of suspended sediment into the McCloud Reservoir and the lower river. Some of the sediment is stored in McCloud Reservoir, particularly in the upper 2-3 miles of the reservoir. Fine sediment passes through the reservoir and into Lower McCloud River, causing periodic high and prolonged turbidity events. Continuous turbidity monitoring over five events in August-October 2007 and August-September 2008 showed downstream turbidity levels in the Lower McCloud River ranging from 65 to 300 Nephelometric Turbidity Unit (NTU) below McCloud reservoir, 12 to 155 NTU above Claiborne Creek, and 5 to 72 NTU above Shasta Lake (Nevares and Sagaves 2009).

Additional turbidity data have been collected post-relicensing with studies downstream of McCloud Reservoir at The Nature Conservancy's Kerry Landreth Preserve headquarters (1.6 miles downstream of Ah-Di-Nah Campground) (2010 through 2024) and at the USGS Gage 1168000 on the McCloud River above Shasta Lake. These data are shown in Section 4.5.3.6,**Error! Reference source not found.**. Analysis of these data indicate that runoff events and fluctuating reservoir levels likely result in the resuspension and mobilization of previously deposited fine sediment in McCloud Reservoir and cause high turbidity in the McCloud River below McCloud Dam (McMillen & McBain 2024). It is possible that the Hydroelectric Project can cause turbidity below McCloud Dam to exceed Basin Plan turbidity standards (see Section 4.5.3.6, Figure 4-6).

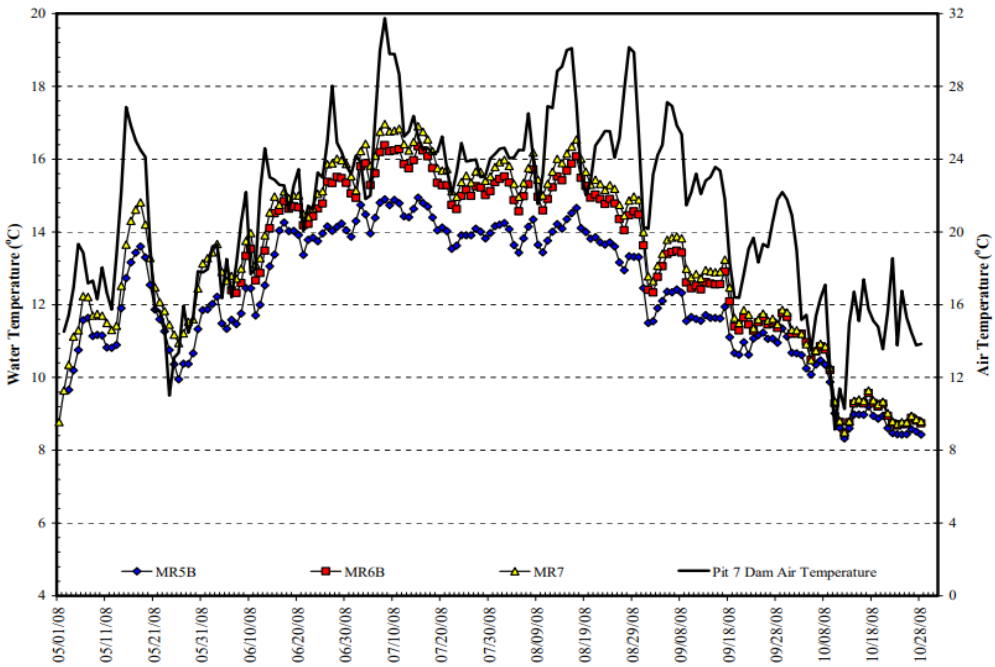


Figure 4-1. Comparison of daily average water temperature at the McCloud River monitoring stations above (top) and below (bottom) Squaw Valley Creek, 2008.

Table 4-1. Water temperature monitoring stations, location, and river mile.

Gage Name	Gage Location	River Mile
MRA	McCloud River at Wintun Gage Station above McCloud Reservoir	--
MRB	MRB McCloud River below McCloud Reservoir	23.9
MR1	MR1 McCloud River above Hawkins Creek	22.8
MR3A	McCloud River above Ladybug Creek	8.7
MR4A	McCloud River above Claiborne Creek	12.0
MR5A	McCloud River above Squaw Valley Creek	11.2
MR5B	McCloud River below Squaw Valley Creek	9.8
MR6B	McCloud River below Chatterdown Creek	4.2
MR7	McCloud River above Shasta Lake	1.9

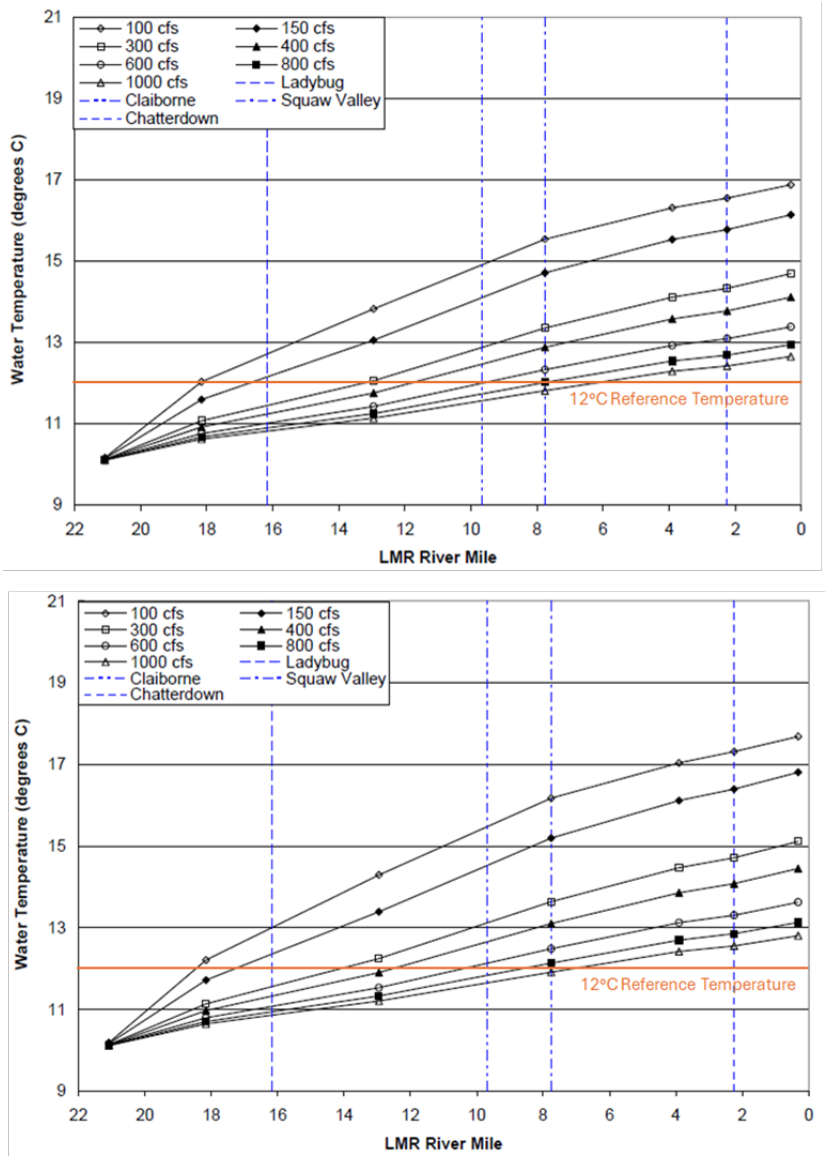


Figure 4-2. Lower McCloud River water temperature simulations for August with normal hydrology (50% exceedance) and normal meteroology (50% exceedance) (top) and August with dry hydrology (75% exceedance) and warm meterology (25% exceedance).

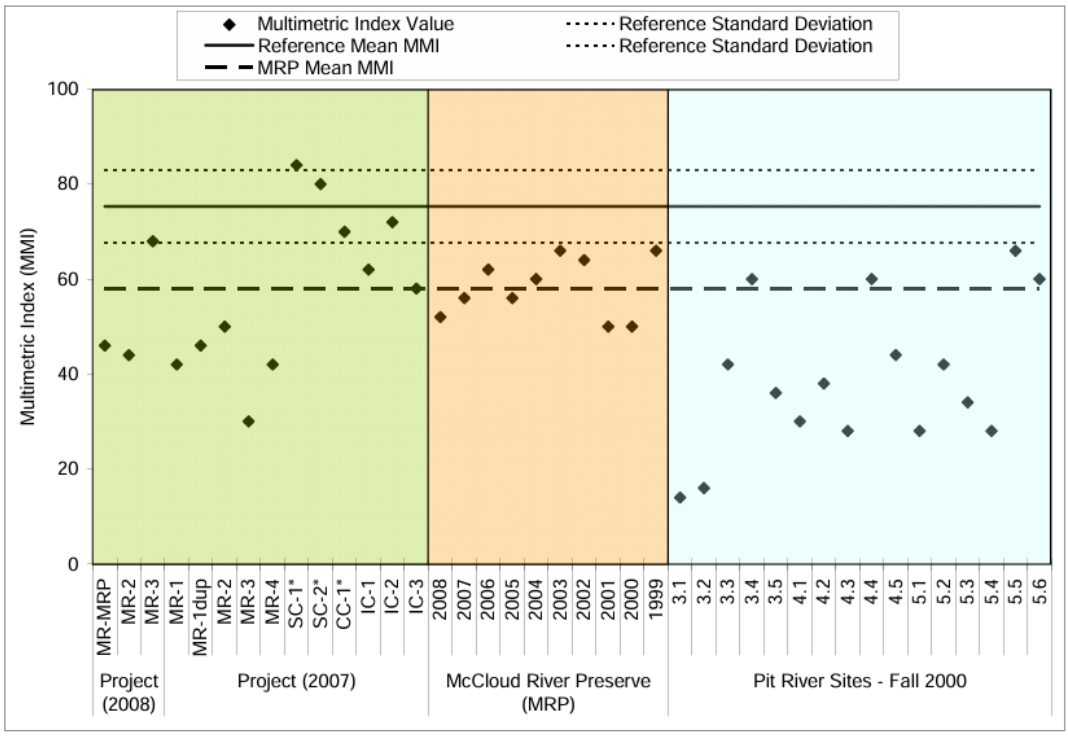
Note: The 12°C reference line is the water temperature above which Chinook salmon egg incubation mortality begins.

Aquatic Species

This section provides a summary of aquatic species known to occur in the Proposed Project area and their location, including benthic macroinvertebrates (BMI), aquatic mollusks, non-anadromous fish, anadromous fish, aquatic amphibians (see Section 4.4.1.2 for terrestrial amphibians), aquatic reptiles, and special status aquatic species. Table 4-2 shows a list of aquatic species in the Proposed Project area. A table of special status aquatic and terrestrial species is included in Appendix D.

Benthic Macroinvertebrates

PG&E conducted BMI sampling in the Proposed Project-affected reaches of the Lower McCloud River below McCloud Dam and Iron Canyon Creek below Iron Canyon Dam in August and September 2007 and November 2008. During the 2007 sampling, PG&E also collected reference samples from Squaw Valley Creek (a tributary of the McCloud River) and Clear Creek (a tributary to Iron Canyon Reservoir). In addition, PG&E acquired historical (1999–2008) BMI data from The Nature Conservancy's McCloud River Preserve and from the Pit River (Pit 3, 4, 5 Hydroelectric Project) for comparison purposes. From the 14 benthic samples collected by PG&E in 2007 and 2008, a total of 6,970 organisms comprising 95 distinct taxa were collected. Insects comprised a majority of the benthic community, including 13 mayfly taxa, 19 stonefly taxa, 18 caddisfly taxa, and nine beetle taxa. Other invertebrates included oligochaetes, clams, and gastropods. A multimetric index based on five metrics, described by Rehn et al. (2007) for hydropower projects, was calculated for each sample taken within the Proposed Project area (Figure 4-3). Overall, the physical habitat data and BMI samples collected over ten years within the Proposed Project area generally indicated good aquatic habitat conditions and water quality. The McCloud River site results, however, were generally lower than the results for the reference sites and Iron Canyon Creek sites.



Note: Solid horizontal line is reference sample mean MMI bracketed by dotted lines representing standard deviation; dashed line is mean MMI of the historical MRP data. Reference sample mean and standard deviation derived from the McCloud-Pit and DeSabla-Centerville Projects (n=20).

Figure 4-3. Multimetric index (MMI) values for the Proposed Project sites (reference sites identified with an asterisk), historical data from the Nature Conservancy's McCloud River Preserve, and historical data from the Pit River (MR = McCloud River sites, IC = Iron Creek sites, SC = Squaw Valley Creek, CC = Cedar Salt Log Creek) (Source Nevares and Orr 2009, Figure 2).

Aquatic Mollusks

An aquatic mollusk survey was conducted in the summer and fall of 2007 to inventory mollusk species in the Proposed Project vicinity. This included the reservoirs (McCloud, Iron Canyon, Pit 6, and Pit 7 reservoirs), the Lower McCloud River, Iron Canyon Creek, and tributaries to McCloud and Iron Canyon Reservoirs. In total, three species of freshwater mussels, four species of Sphaeriacean clams, and nine species of aquatic snails were found during the 2007 survey. Large freshwater mussels were found. California floater (*Anodonta californiensis/nuttalliana*) were found in lentic habitat in Pit 6 and Pit 7 reservoirs and western pearlshell (*Margaritifera falcata*) were found in lotic habitat in the mainstem Lower McCloud River. No federal- or California-listed mollusks were identified. Two Forest Service Special Status (FSSS) aquatic mollusk species —the California floater and the nugget pebblesnail (*Fluminicola seminalis*)—were found during the aquatic mollusk surveys (Nevares et al. 2008),

Non-Anadromous Fish

During fish surveys conducted in the fall of 2007 and 2008, a total of 15 species were observed, including four species (bluegill, brook trout, channel catfish, and spotted bass) that had not been previously documented. Five species (bigeye marbled sculpin, common carp, green sunfish, pit roach, and speckled dace) that were historically observed in Proposed Project reservoirs were not observed in the 2007 and 2008 surveys. Table 4-2 includes a summary of fish species found in the Proposed Project reservoirs and stream reaches.

The dominant species in Proposed Project reservoirs with colder water (McCloud and Iron Canyon) and Proposed Project stream reaches with colder water (Lower McCloud River and Iron Canyon Creek) were rainbow trout and brown trout, with rainbow trout being dominant. Bass, which could be an important predator species of reintroduced winter-run Chinook salmon in the Lower McCloud River, were not observed in the sampling but are likely present in the lower river / reservoir confluence area. In the warmer transition-zone habitat (Pit 6 and Pit 7 reservoirs and Pit 7 Afterbay), the dominant species included tule perch and hardhead.

Only one of the 15 species observed, hardhead (*Mylopharodon conocephalus*), is a special status species (California species of special concern). Hardhead were found in Pit 6 and Pit 7 Reservoirs and Pit 7 Afterbay. Hardhead is a large, native minnow generally found in undisturbed areas of larger low- to middle-elevation streams (elevation between 30 and 4,760 feet in the Sacramento and San Joaquin watersheds). Its range extends from the Kern River in the south to the Pit River in the north. Hardhead inhabit areas that have clear, deep pools with sandy, gravel/boulder substrates and slow water velocities (less than 0.05 foot per second). Hardhead co-occur with Sacramento pikeminnow and usually with Sacramento suckers and tend to be absent from streams where introduced species, especially centrarchids, predominate (Moyle 2002).

2024 CNDDB records show that there is one additional fish species known to occur within the Proposed Project area, Pit-Klamath brook lamprey (*Entosphenus lethophagus*) (California Species of Special Concern [CSC]). This species was not observed during the 2007 and 2008 fish surveys but has been observed in the Proposed Project area during the annual electrofishing surveys that took place from 2011 and 2014. The species were found within Pit 3 Reach (Pit 4 Reservoir), Pit 4 Reach (Pit 5 Reservoir), and Pit 5 Reach. This species is endemic to the Pit River System. They primarily occupy habitats in clear, cool waters of rivers and streams within substrates and aquatic vegetation. They also require gravel riffles for spawning and muddy backwater habitats for ammocoete burrows.

Anadromous Fish

Prior to the completion of Shasta Dam in 1942, Chinook salmon and other anadromous fishes were able to travel up the McCloud River as far as the 20-foot-high Lower Falls above the present McCloud Reservoir. Since the completion of Shasta Dam, Chinook salmon had been extirpated from the McCloud and Pit Rivers. Extirpation of Chinook populations had impacts to other native species in the ecosystem, notably bull trout (originally identified as Dolly Varden) that feed on early life stages of Chinook. Bull trout are no longer present in the McCloud and Pit River watersheds. In 1950, Keswick Dam was completed downstream of Shasta Dam, further blocking anadromous fish passage.

Reintroduction Efforts

Recently, through collaborative efforts of numerous federal and state agencies and the WWT, winter-run Chinook salmon eggs have been reintroduced to the McCloud River. In 2014, NFMS adopted a final recovery plan for the Sacramento River (SR) winter-run Chinook salmon and Central Valley (CV) spring-run Chinook salmon that explained that establishing populations above impassable barriers such as Shasta Dam would aid recovery of the species. “Urgent Drought Actions” developed by NOAA in 2022-2023 (NMFS 2023a) led to the proposal and adoption of an ESA 10(j) and 4(d) Final Rule designating a nonessential experimental population (NEP) of SR winter-run and CV spring-run Chinook salmon (Federal Register 88 FR 58511, 08/28/2023). The designation prohibits take of SR winter-run and CV spring-run Chinook salmon in the NEP area, with exceptions for take by authorized personnel acting in compliance with 50 CFR 223.203(b), take incidental to lawful activities including but not limited to recreation, water management, and power production, and take pursuant to a permit issued by NMFS under Section 10 of the ESA.

In 2022, under the authority of ESA §10(a)(1)(A), amended permit 16477-3A, the U.S. Fish and Wildlife Service (USFWS) allowed fertilized eggs to be delivered to the McCloud River Ah-Di-Nah Campground from the USFWS Livingston Stone National Fish Hatchery near Redding, California. Eggs were delivered in two batches of 20,000, the first by truck and the second by helicopter. The first batch of hatchery eggs was placed in streamside remote site incubators (RSI) (NMFS 2022). A few days after the eggs were reintroduced, starting approximately July 16, 2022, turbidity in the McCloud River rose to extreme levels (turbidity peaked at 266.7 NTU). To reduce impacts, the surviving fertilized eggs were transferred to streamside heath trays (incubators) to reduce sedimentation. After incubation and rearing, the developed fry were released into the McCloud River and 1,600 juveniles were collected at rotary screw traps (RSTs) set near McCloud Bridge 20 miles downstream from the egg incubation site. These fish were then transported to the SR downstream of the Keswick Dam to continue their migration to the Pacific Ocean (NMFS 2023b).

Independent of the Urgent Drought Actions, in February 2022, the DWR received $1.5 million in funding for the Juvenile Salmonid Collection System (JSCS) Pilot Project in the upper McCloud Arm of Shasta Lake. The goal of the JSCS Pilot Project is to test a system that would improve fish passage around high-head dams through the efficient collection and downstream passage for juvenile fish migrating out to the ocean. The design and evaluation team is led by the DWR in partnership with NOAA Fisheries, CDFW, the WWT, and others (DWR 2022).

In 2023, NOAA Fisheries, WWT, CDFW, and USFWS worked together again to reintroduce juvenile SR winter-run Chinook salmon into the Lower McCloud River. On July 12 and July 26, 2023, 25,528 and 28,224 eggs, respectively, were transported by helicopter from the Livingston Stone National Fish Hatchery to the Ah-Di-Nah campground. For the eggs in the care of the WWT, Chief Sisk, working with University of California at Davis, incorporated “Tribal Ecological Knowledge” or “TEK” to develop the “Nur

Nature-based Incubation System." The TEK system functions by placing eggs in incubation chambers that resemble the natural riverine system. This method provides salmon with the freedom to swim after hatching and the ability to choose when to enter the McCloud River (ICO 2024). At the end of the season, the CDFW captured and transported 7,775 juveniles from the McCloud River to the Lower SR. Researchers used two in-water trapping methods to collect juvenile salmonids in the Lower McCloud River.

In 2024, approximately 80,000 eggs were incubated in the McCloud River, and juveniles were captured and transported to the Lower SR. Similarly, the plan for 2025 is to continue winter-run Chinook salmon egg transfer (80,000 eggs), incubation, recapture, and transfer of juveniles to the SR. Adults will not be transferred to the McCloud River until water treatment/sanitation upgrades have been completed at Livingston Stone National Fish Hatchery. NMFS, USFWS, BOR, and CDFW are in conversation and pursuing these upgrades (Steve Edmondson, NMFS, Email 2/27/2025 to Craig Addley).

In 2025, the CDFW confirmed adult winter-run Chinook salmon presence and spawning activity in the Lower McCloud River near Ash Camp, including observation of an adult female exhibiting spawning behavior with small males (jacks) present. Subsequent surveys documented multiple completed redds upstream of McCloud Dam. These fish are believed to have originated from earlier egg rearing efforts in the McCloud River followed by juvenile rearing in Shasta Lake. Although surveys were limited by access and turbidity, the findings confirm use of suitable spawning habitat and provide evidence of early recolonization consistent with ongoing anadromous fish reintroduction efforts. This indicates that baseline conditions allow Chinook salmon to reach adulthood and spawn, though survival rates across the life cycle are not clear. CDFW staff have recommended further surveys of spawning habitat (CDFW Memo 8/8/2025)

The Winter-run Action Plan (WRAP) was included the Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project (NMFS 2024a) and in the Record of Decision for the Long-Term Operation of the Central Valley Project and State Water Project (Reclamation 2024). The WRAP prioritizes and supports the implementation of six actions, including the reintroduction of winter-run Chinook Salmon into the McCloud River.

Aquatic Amphibians

Pacific Tailed Frog. Pacific tailed frogs (*Ascaphus truei*) are a California species of special concern. The Pacific tailed frog uses cold, rocky streams in humid forests of Douglas-fir, pine, spruce, hemlock, redwood, maple, and alder, with interspersed grassland or chaparral. Tailed frog tadpoles and adults were observed in Ladybug Creek, a tributary to the Lower McCloud River, during two separate visits in the summer of 2007.

Foothill Yellow-Legged Frog. The foothill yellow-legged frog (*Rana boylii*) (FYLF) in the Proposed Project area belong to the Northwest/North Coast clade. Unlike other clades in California, the Northwest/North Coast clade is not listed as threatened or endangered either under CESA or ESA. FYLF inhabits small streams below 5,000 feet msl where breeding occurs in low- to moderate- gradient streams in shallow edge-water areas, often close to confluences with tributary streams. FYLF were observed at seven sites located between river mile (RM)[14] 1.4 and RM 5.7 on the Lower McCloud River and associated tributaries. Evidence of breeding (egg masses or tadpoles) was observed at four mainstem sites. Post-

[14] RM is a measure of distance in miles along a river from its mouth, which begins at RM 0.

metamorphic frogs (adults, juveniles, or young-of-year) were observed at four mainstem sites and three tributaries.

In 2008, a total of twelve egg masses were observed in the lower 5.7 miles of the 19 mile-long Lower McCloud River between May 8 and June 10. One egg mass was observed at Site 119 (RM 1.4), six egg masses were observed at Site 120 (RM 1.7), four egg masses were observed at Site 122 (RM 2.0), and one egg mass was observed at Site 140 (RM 5.7). All egg masses were recorded at depths and velocities consistent with FYLF breeding in other California watersheds.

Aquatic Reptiles

Northwestern Pond Turtle. The northwestern pond turtle (*Actinemys marmorata*) is a California species of special concern and the U.S. Fish and Wildlife Service proposed to list the species as threatened under ESA (50 CFR Part 17, 10/03/2023) but as of spring 2026 no official listing has occurred. This species inhabits ponds, lakes, rivers, marshes, streams, and irrigation ditches with rocky or muddy bottoms and herbaceous vegetation. Western pond turtles were found in Pit 6 and Pit 7 Reservoirs during 2007, as well as along the Lower McCloud River in 2007 and 2008. At Pit 6 Reservoir, western pond turtles were observed in the downstream half of the west side of the reservoir. At Pit 7 Reservoir, western pond turtles were observed in the downstream third of the north (river right) side of the reservoir. On the Lower McCloud River, adult and juvenile western pond turtles, as well as one western pond turtle egg, were incidentally observed at four sites between RM 1.4 and 3.0 during FYLF surveys in 2007 and 2008.

Table 4-2. Fish and Aquatic Species Identified in Proposed Project Reservoirs and Stream Reaches During Relicensing Technical Studies and other Studies, including recently reintroduced spring-run Chinook salmon eggs/juveniles.

Species	Native / Introduced / Reintroduced	Federal ESA and CESA Status CDFW	Proposed Project Reservoirs/Afterbays					Proposed Project Stream Reaches	
			McCloud Reservoir	Iron Canyon Reservoir	Pit 6 Reservoir	Pit 7 Reservoir	Pit 7 Afterbay	Lower McCloud River	Iron Canyon Creek
Winter-run Chinook Salmon (*Oncorhynchus tshawytscha*)	N/R	FE [*]/CE						X [*]	
Bluegill (*Lepomis macrochirus*)	I	—				x			
Brook trout (*Salvenlinus fontinalis*)	I	—	x						
Brown trout (*Salmo trutta*)	I	—	x	x				x	x
Channel catfish (*Ictalurus punctatus*)	I	—			x				
Hardhead (*Mylopharodon conocephalus*)	N	CSC			x	x	x		
Largemouth bass (*Micropterus salmoides*)	I	—				x			
Pit-Klamath brook lamprey (*Entosphenus lethophagus*)	N	CSC			x				
Pit sculpin (*Cottus pitensis*)	N	—					x		x
Rainbow trout (*Oncorhynchus mykiss*)	N	—	x	x		x	x	x	x
Riffle sculpin (*Cottus shasta*)	N	—			x			x	
Sacramento pikeminnow (*Ptychocheilus grandis*)	N	—			x	x		x	
Sacramento sucker (*Catostomus occidentalis*)	N	—			x	x	x	x	
Smallmouth bass (*Micropterus dolomieu*)	I	—				x	x		
Spotted bass (*Micropterus punctulatus*)	I	—					x		
Tui chub (*Gila bicolor*)	N	—				x			
Tule perch (*Hysterocarpus traski*)	N	—			x	x			
Foothill yellow-legged frog – north coast DPSd (*Rana boylii)*	N	CSC							
Pacific tailed frog (*Ascaphus truei)*	N	CSC						x**	
Northwestern pond turtle (*Actinemys marmorata)*	N	PT/CSC			x	x		X	

* Nonessential Experimental Population (eggs hatched streamside and juveniles released into the river).
** Found only in Ladybug Creek, a tributary of the Lower McCloud River

Key: CE = California Endangered
CSC = California Species of Special Concern
FE = Federal Endangered
I = Introduced
N = Native
PT = Federal Proposed Threatened
R = Reintroduced

4.4.1.2 Terrestrial Resources

Terrestrial Habitats

Provided below is a brief summary of terrestrial habitats in the Proposed Project area.

- Vegetation Communities. Forty-two vegetation series or types were mapped in the Proposed Project area. The Proposed Project area is dominated by Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), and other mixed conifer vegetation types (approximately 75 percent of the mapped area); and also includes a variety of other vegetation types typical of mid-elevation forests and valleys found in the southeastern Klamath Mountains and southern Cascade regions. Ten of the 42 vegetation series or types identified are indicative of wetland or riparian habitats. Wetland and riparian habitats are dependent on particular hydrologic regimes and are, therefore, considered particularly sensitive to potential Proposed Project effects. The results of riparian vegetation studies conducted as a component of the relicensing are provided below.

- Riparian Vegetation. A riparian vegetation study was conducted to assess potential Proposed Project effects in the riparian zone of the Lower McCloud River. The riparian zone of the Lower McCloud River, as defined by the presence of riparian vegetation, is generally less than 75 feet wide because of the confined channel and steep nature of the surrounding valley walls. Vegetation within the riparian zone is dominated by white alder (*Alnus rhombifolia*), blackfruit dogwood (*Cornus sessilis*), big-leaf and vine maple (*Acermacrophyllum* and *A. circinatum*), blackberry (*Rubus* spp.), poison oak (*Toxicodendron diversilobum*), and a variety of herbaceous species, including naked sedge (*Carex nudata*) and Indian rhubarb (*Darmera peltata*). Douglas-fir and mixed conifer stands occur along the uplands and toe-slopes adjacent to riparian vegetation.

Terrestrial Species

This section provides a summary of terrestrial special status plants and wildlife known to occur in the Proposed Project area.

Refer to Appendix D for a list of special status plants considered in this analysis including their status, habitat requirements, blooming period information, and potential for occurrence in the Proposed Project area. Special status plants include those listed as rare, endangered, or threatened under CESA or assigned a California Rare Plant Ranking (CRPR) of 1, 2, or 3 by the California Native Plant Society (CNPS) (2024). In addition, this analysis includes plant species that are listed as threatened or endangered under the federal ESA.[15]

Refer to Appendix D for a list of special status terrestrial wildlife species considered in this analysis, including their status, habitat requirements, and potential for occurrence in the Proposed Project area. Special status terrestrial wildlife are defined as animals that are proposed, candidate, or listed as threatened or endangered under CESA; wildlife considered species of special concern by CDFW; and

[15] Table 3-4 was adapted from Table 3 in TM-12. Table 3-4 includes updates to account for changes occurring since TM-12 was published in 2009. These changes include but are not limited to identification of new species within the Project vicinity (CNDDB 2024); change in name or status of some species; and additional information on the distribution, range, and or habitat association of some species. Further, Table 3-4 does not include CRPR 4 species, as CRPR 4 species are not required to be analyzed under CEQA.

California fully protected species. In addition, this analysis includes wildlife species that are proposed, candidate, or listed as threatened or endangered under the federal ESA.

Special Status Plants

There are no federal- or state-listed special status plants in the Proposed Project area, and no special status lichens or fungi were documented in the Proposed Project area. The following special status plant species listed below with a CRPR of 1, 2, or 3 have been identified in the Proposed Project area. Refer to Appendix D for location and number of occurrences.

- Shasta eupatorium (*Ageratina shastensis*); CRPR 1B.2. (Nevares and Jurjavcic 2009; California Natural Diversity Database [CNDDB] 2024)
- Rattlesnake fern (*Botrypus virginianus*); CRPR 2B.2 (CNDDB 2024)
- Shasta limestone monkeyflower (*Erythranthe taylorii*); CRPR 1B.1 (CNDDB 2024)
- Butte County fritillary *(Fritillaria eastwoodiae*); CRPR 3.2 (Nevares and Jurjavcic 2009; CNDDB 2024)
- Howell's lewisia (*Lewisia cotyledon* var. *howellii*); CRPR 3.2 (Nevares and Jurjavcic 2009)
- Siskiyou jellyskin lichen (*Scytinium siskiyouense*); CRPR 1B.1 (CNDDB 2024)
- Canyon Creek stonecrop (*Sedum paradisum* ssp. *paradisum*); CRPR 1B.3 (CNDDB 2024)

Terrestrial Invertebrates

Valley Elderberry Longhorn Beetle. Fifteen elderberry populations were identified during botanical surveys conducted as a component of the relicensing. However, in September 2015, the USFWS withdrew the proposed rule to remove valley elderberry longhorn beetle (VELB) from the federal list of Endangered and Threatened Wildlife and concurrently reevaluated and revised the range of the species. Based on the revised range, the Proposed Project is no longer in the range for VELB.

Terrestrial Amphibians

Shasta Salamander. Shasta salamanders (*Hydromantes shastae*) are listed as threatened under CESA. Shasta salamanders were found during relicensing surveys at two sites, McCloud Reservoir and Fenders Flat/Pit 7 Afterbay Dam. This species primarily inhabits limestone outcrops and caves and adjacent slope habitats in mixed forests of Douglas-fir, foothill pine, and black and canyon oak. Elevations range from 1,000 to 3,000 feet msl, and it may also use a variety of non-limestone habitats within its known range. Near McCloud Reservoir, adult and juvenile Shasta salamanders were found in both limestone and non-limestone habitats. Near Fenders Flat/Pit 7 Afterbay Dam, adult Shasta salamanders were found in non-limestone habitat, generally located west of Pit 7 Afterbay Dam on the north side of the Pit River channel. The species likely occurs in other available limestone and non-limestone habitats throughout the Proposed Project area.

Avian Species

American Goshawk. The American goshawk (*Astur atricapillus*), a large forest-dwelling raptor that uses a wide variety of habitat types for foraging, nesting, and dispersal, is a California species of special concern. Six northern goshawk individuals were detected. Four of the northern goshawk detections were associated with a suspected northern goshawk activity center located on USFS land approximately 0.5

mile south of Ah-Di-Na Campground. The remaining two detections occurred at the southeast end of the Pit 6 Transmission Line, approximately 1.5 miles northwest of Wengler. No additional detections occurred during follow-up surveys for these detections, nor were any nests found.

Willow Flycatcher. The willow flycatcher (*Empidonax traillii*) is a small migratory passerine bird that nests in riparian willow thickets. This species is listed as endangered under CESA. Willow flycatchers were detected at the Iron Canyon Reservoir and Fenders Flat/Pit 7 Afterbay Dam survey areas, but nesting was not observed in the Proposed Project area during relicensing surveys. Based on this, willow flycatchers are considered "present" at Iron Canyon Reservoir in the Cedar Salt Log Creek and McGill Creek inlets, and at Fenders Flat/Pit 7 Afterbay Dam survey areas, but not "territorial" for the purposes of determining occupancy (i.e., breeding).

American Peregrine Falcon. The American peregrine falcon (*Falco peregrinus anatum*) was officially removed from listing under the federal ESA and CESA in 1999. Nesting peregrine falcon pairs were found along almost all major Proposed Project water bodies. Within the Proposed Project area, peregrine falcons nesting pairs were documented in large rock outcroppings along the McCloud River, Iron Canyon Creek, Pit 7 Reservoir, and Pit 6 Reservoir. Although the location of the STNF historical eyrie (i.e., nest) at Pit 6 could not be verified, it is likely to be the same territory now occupied by the Pit 6-15 pair documented during 2007–2008 surveys. The 2007–2008 surveys also documented breeding at four territories, three of which are presumed to be previously undocumented. Each nesting pair produced at least one young, and in most cases, two young were observed per active nest.

Bald Eagle. The bald eagle (*Haliaeetus leucocephalus*) was federally delisted (as of August 2007), but still retains special status under the Eagle Act, as a California State endangered species, and a California fully protected species (CA Fish & Game Code § 3511). There are eight bald eagle nesting territories in the Proposed Project area, including two previously unknown territories discovered during relicensing studies at Chatterdown Creek and McCloud Bridge, and a third territory at Pit 6 Reservoir. Bald eagle prey studies in the 1980s at McCloud and Iron Canyon Reservoirs revealed a diverse diet of salmonids, water and land birds, and mammals, including deer and squirrels. It is suspected that salmonids make up a large portion of the diet of these eagles.

Northern Spotted Owl. The northern spotted owl (*Strix occidentalis caurina*), a medium-sized nocturnal raptor that inhabits mature forest habitats, is listed as threatened under the federal ESA and CESA and is a California species of special concern. Critical habitat has been designated for the species (USFWS 2021), and a revised recovery plan was released (USFWS 2011). There is a designated Critical Habitat for this species along the McCloud Tunnel and along the western edge of Iron Canyon Reservoir in the Proposed Project area. No northern spotted owls or active nests were detected in the Proposed Project area. One single female northern spotted owl of unknown reproductive status was detected just outside of the Proposed Project area in the upper Mink Creek drainage, east of Van Sicklin Butte.

Bats

The Proposed Project area includes aquatic habitats (e.g., reservoirs, rivers), mixed conifer forests, open habitat, and structures to support hydroelectric operations. Such habitats provide features that support roosting, foraging, and migration for various bat species. Habitat for day, night, and maternity roosts is available in the Proposed Project area and includes human-made structures, trees (particularly snags and live or dead oaks), and rock features (e.g., cliffs, large rock outcrops, and caves). Foraging habitat is present in forests, along forest edges, in meadows, and over water bodies, including reservoirs, rivers, and streams. Streams, rivers, and transmission line corridors may also provide migration corridors for populations that migrate through the Central Valley.

Surveys to assess habitat and the presence of bat species in the Proposed Project area were conducted in 2007 and 2008. Sixteen bat species, including five special status, are known to occur in the Proposed Project area:

Pallid bat (*Antrozous pallidus*) is a California species of special concern. Individuals were detected acoustically during relicensing studies at McCloud and Iron Canyon Reservoirs and associated structures, and detected acoustically and captured at Pit 6 and Pit 7 Reservoirs and associated structures.

Townsend's big-eared bat (*Corynorhinus townsendii*) is a California species of special concern. This species was detected acoustically during relicensing studies at the Pit 6 Reservoir shoreline and was both detected acoustically and captured along the limestone caves at McCloud Reservoir.

Spotted bat (*Euderma maculatum*) is a California species of special concern. Individuals have been previously documented adjacent to an inactive sewage lagoon near the town of McCloud.

Western mastiff bat (*Eumops perotis*) is a California species of special concern. Individuals were detected acoustically during relicensing studies at the Pit 6 Dam, the first record of this species for the Pit River.

Western red bat (*Lasiurus blossevillii*) is a California species of special concern. Individuals were detected acoustically during relicensing studies at McCloud, Iron Canyon, Pit 6, and Pit 7 Reservoirs and associated structures.

Special Status Mammals

Special status mammals such as Sierra Nevada red fox (*Vulpes vulpes necator*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), ringtail (*Bassariscus astutus*), and Oregon snowshoe hare (*Lepus americanus klamathensis*) may potentially occur in suitable forest and riparian habitats in the Proposed Project area. In addition, one special status forest carnivore, the fisher (*Pekania pennanti*), is known to occur in the Proposed Project area. Information on this species is summarized below.

Fisher – West Coast Distinct Population Segment (DPS). The fisher is a California species of special concern. This medium-sized forest carnivore is strongly associated with mature and late successional forest habitats. The Proposed Project area is located within the current known range for fisher. One incidental fisher sighting occurred in the Proposed Project area in 2007 at Forest Road 11 on the northeast side of Iron Canyon Reservoir.

4.4.2 Regulatory Setting

4.4.2.1 Federal

Federal Power Act

Section 18 Fishway Prescriptions

Section 18 of the Federal Power Act (FPA) states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce of the U.S. Department of the Interior. By letter filed January 28, 2010, the U.S. Department of the Interior requested that a reservation of authority to prescribe fishways be included in any project license for the Proposed Project. NMFS filed a request for reservation of authority on January 29, 2010.

Section 4(e) Conditions

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. The USFS filed 34 Section 4(e) conditions for the Proposed Project on January 29, 2010, and one revised condition on March 1, 2010. The USFS filed modified 4(e) conditions on November 29, 2010. Conditions relevant to this analysis include:

- Condition No. 11 Protection of USFS Special Status Species
- Condition No. 15 Pesticide-Use Restrictions on the National Forest System Lands
- Condition No 16 Modification of 4(e) after biological opinion or water quality certification
- Condition 19 Stream Flow
- Condition 20 Water Quality and Temperature Monitoring
- Condition 21 Large Woody Debris
- Condition 22 Erosion and Sediment Control and Management
- Condition 23 Coarse Sediment Management Plan
- Condition 27 Aquatic Biological Monitoring

Federal Endangered Species Act

The Federal ESA requires that both USFWS and NMFS maintain lists of threatened species and endangered species. An “endangered species” is defined as “…any species which is in danger of extinction throughout all or a significant portion of its range.” A “threatened species” is defined as “…any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 USC 1532). Section 9 of the ESA makes it illegal to “take” (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct) any endangered species of fish or wildlife, and regulations contain similar provisions for most threatened species of fish and wildlife (16 USC 1538).

Section 7

Section 7 of the ESA requires all Federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated Critical Habitat. To ensure against jeopardy, each Federal agency must consult with USFWS or NMFS, or both, if the Federal agency determines that its action might impact a listed species. NMFS jurisdiction under the ESA is limited to the protection of anadromous fish, marine fish and reptiles, and most marine mammals; all other species are within USFWS jurisdiction. Nonessential experimental populations designated under Section 10(j) of the ESA that do not occur within a National Wildlife Refuge or National Park are treated as species proposed to be listed for purposes of Section 7 of the ESA, which means that Federal agencies must confer, rather than consult, with USFWS and/or NMFS regarding the effect of Federal agency actions. The results of a Section 7 conference serve as advisory recommendations.

Critical Habitat for listed species consists of: (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of Section 4 of the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provision of Section 4 of the Act, upon a determination by the Secretary of the Department of the Interior that such areas are essential for the conservation of the species.

Previous Biological Opinions—NMFS (2009; 2011), USFWS (2008), (NMFS 2019; USFWS 2019) covered operations of the combined CVP and SWP. Recently, the Biological Opinions have been updated (NMFS 2024a; USFWS 2024). The NMFS Biological Opinion covers threatened and endangered salmonids and green sturgeon plus Critical Habitat, including species in the Sacramento River below Shasta Dam and Keswick Dam that historically inhabited the McCloud and Pit rivers. In particular, winter-run Chinook salmon and related efforts to reintroduce winter-run into the McCloud River. The USFWS Biological Opinion (USFWS 2024) covers endangered Delta smelt and Delta smelt Critical Habitat.

Magnuson-Stevens Fishery Conservation and Management Act

Section 305(b)(2) of the 1996 reauthorization of the Magnuson-Stevens Conservation and Management Act (MSFCMA) added a provision for Federal agencies to consult with NMFS on activities or proposed activities authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH) for commercially managed marine and anadromous fish species. Consultation on any activity that might adversely affect EFH is required by NMFS under the MSFCMA, as amended by the Sustainable Fisheries Act of 1996. EFH includes specifically identified waters and substrate necessary for fish spawning, breeding, feeding, or growing to maturity. EFH also includes all habitats necessary to allow the production of commercially valuable aquatic species, to support a long-term sustainable fishery, and contribute to a healthy ecosystem.

The Pacific Fishery Management Council, one of eight regional fishery management councils established by the MSFCMA, has developed Fishery Management Plans designating EFH for groundfish, Pacific salmon, highly migratory species, and coastal pelagic species. The action area contains the following EFH:

- Groundfish EFH, which overlaps with the Action Area in the SR up to Colusa and the Delta;
- Pacific salmon EFH, specifically EFH for Chinook salmon, which overlaps with the entire Action Area; and
- Coastal pelagic species EFH, which overlaps with the Action Area in the Delta.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act, as amended in 1964, was enacted to protect fish and wildlife when Federal actions result in the control or modification of a natural stream or body of water. The statute requires Federal agencies to take into consideration the effect that water-related projects would have on fish and wildlife resources. Consultation and coordination with the USFWS and State fish and game agencies are required to address ways to prevent loss of and damage to fish and wildlife resources and to further develop and improve these resources.

Clean Water Act and Rivers and Harbors Act

The U.S. Army Corps of Engineers (USACE) has regulatory authority over activities within certain waters within the Proposed Project area. Depending on the activity and the location of that activity in relation to

particular resources, USACE may be required to issue an authorization for that activity under the following statutes.

- Section 404 of the CWA (discharge of dredged or fill material into waters of the United States).
- Section 401 of the CWA (ensures that federally permitted projects will comply with state water quality standards before federal approval can be issued).
- Section 10 of the Rivers and Harbors Act (activities in, under, or over navigable waters of the United States).
- Section 14 of the Rivers and Harbors Act (activities that have the potential to affect USACE civil works projects, including project levees).

Activities that would result in the discharge of dredged or fill materials into "waters of the United States" must obtain authorization from USACE pursuant to Section 404 of the CWA (33 United States Code [USC] 1251 et seq.). Individual Permits are designed for activities that have the potential to have more than a minimal effect on jurisdictional waters or that otherwise do not qualify to proceed under a General Permit.

Activities that would involve the construction of any structure in or over any navigable water of the United States must obtain authorization from USACE pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 USC Section 403 et seq.; 33 CFR Sections 322 et seq.). Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if "the structure or work affects the course, location, or condition of the water body" (33 CFR Section 322.3[a]). The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable water of the United States and applies to all structures. (33 CFR Section 322.2[b]).

Section 14 of the Rivers and Harbors Act (33 USC Section 408) requires permission from the Secretary of the Army, acting through USACE to alter an existing USACE civil works project. To grant permission under Section 408, USACE must determine that the proposed alteration does not impair the usefulness of the USACE project and would not be injurious to the public interest. This is generally referred to as "Section 408 permission." Section 408 permission would be required for alteration and/or modification of federally constructed levees associated with the Proposed Project. The informational requirements under the Section 408 process necessarily includes a detailed level of engineering design, as well as a detailed level of analysis related to effects to the USACE civil works projects and indirect hydraulic effects. The information contained in the previously prepared NEPA documents (e.g. the December 2016 proposed Final EIR/EIS) may not have fully met this level of detail, so when certain design aspects related to effects to civil works projects are completed, additional informational submittals and analysis will be necessary.

U.S. Forest Service, Shasta-Trinity National Forest

As stated in the 1995 STNF Land and Resource Management Plan, the overall management philosophy is to realize integrated multiple resource land management in the context of Ecosystem Management. This goal is to be achieved through the implementation of an environmental agenda that has three major facets:

- **Preservation**-the protection of unique landscapes and their wild and scenic characteristics for the indefinite future.

- **Biodiversity**-at all ecosystem scales, the maintenance of a rich diversity of plants, fish, and wildlife.

- **Sustainable Development for People**-providing high quality recreational experiences, a long-term sustained yield of timber, forage and other resource products, and services consumed by society. This last facet will be compatible with the Preservation and Biodiversity goals.

Specific resource goals applicable to the Proposed Project are listed below:

- Biological Diversity:
  - 2. Integrate multiple resource management on a landscape level to provide and maintain diversity and quality of habitats that support viable populations of plants, fish, and wildlife.
- Facilities
  - 8. Manage the Forests' transportation system to facilitate resource management activities, protect wildlife, meet water quality objectives, and provide recreational access.
- Fisheries
  - 12. Emphasize sport fisheries as a major recreation activity by expanding recreational fisheries opportunities.
  - 13, Emphasize the restoration of summer steelhead and spring-run Chinook salmon habitat in the South Fork Trinity River Basin.
  - 14. Provide for the protection, maintenance, and improvement of wild trout and salmon habitat.
- Riparian Areas
  - 25. Maintain or improve riparian habitat.

4.4.2.2 State

California Endangered Species Act

Sections 2050 to 2115.5 of the California Fish and Game Code define the California ESA, which is intended to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. Under the California ESA, state agencies should not approve projects as proposed, which would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are RPAs available that would prevent jeopardy. In the event alternatives are infeasible, individual projects may be approved with appropriate mitigation and enhancement measures.

The California ESA defines an endangered species as, “a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.” A threatened species is defined as, “a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.” The California Fish and Game Commission is

responsible for listing species under the California ESA, and CDFW is responsible for implementing and enforcing and issuing permits.

Section 2080 of the California Fish and Game Code states that, "no person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product therefore, that the commission determines to be an endangered species or a threatened species…" unless authorized by CDFW via an incidental take statement, a permit, or a memorandum of understanding. "Take" is defined as any activity that would directly or indirectly kill an individual of a species, but the definition does not include harming or harassing as the Federal ESA does. An incidental take permit from CDFW is required for projects that could result in take of a species that is listed as threatened or endangered under the California ESA.

Central Valley Project Improvement Act and Anadromous Fish Restoration Program

The Central Valley Project Improvement Act (CVPIA) (Title 34 of P.L. 102-575) amends the authorization of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes of the CVP having equal priority with irrigation and domestic uses of CVP water. It also elevates fish and wildlife enhancement to a level having equal purpose with power generation.

The CVPIA identifies several goals to meet these new purposes. Significant among these is the broad goal of restoring natural populations of anadromous fish, green and white sturgeon, American shad, and striped bass in Central Valley rivers and streams to double their recent average levels.

Section 3406(b)(1) jointly imparted the responsibilities of implementing the CVPIA to USFWS and Reclamation, although the USFWS has assumed the lead role in the development of the Anadromous Fish Restoration Program (AFRP). The Final Restoration Plan for the AFRP was adopted on January 9, 2001 and will be used to guide the long-term development of the AFRP. Additionally, under USFWS direction, technical teams have assisted in the establishment of components of the AFRP. A key element of the program is instream flow recommendations, including objectives for the Lower American River and upper SR.

Long-Term Central Valley Project and State Water Project (CVPSWP) Operations

The recent Record of Decision for the Long-Term Operation of the CVPSWP Action 5 (Reclamation 2025) serve as the operational standards by which Reclamation and DWR will operate the integrated CVP/SWP system. The alternative describes how Reclamation and DWR operate the CVP and the SWP to divert, store, and convey water consistent with applicable law.

4.4.2.3 Local

Shasta County

The 2004 Shasta County General Plan includes objectives and policies to address the need to preserve unique and important aquatic, fish and wildlife habitats, and plant communities for their biological resource and ecological values, as well as for their direct and indirect benefits to the citizens of Shasta County. (County of Shasta 2004). The General Plan Fish and Wildlife Habitat Element contains the following objectives and policy applicable to the Proposed Project:

- Objective FW-1 Protection of significant fish, wildlife and vegetation resources.
- Objective FW-2 Provide for a balance between wildlife habitat protection and enhancement and the need to manage and use agricultural, mineral extraction, and timber land resources.

- Policy FW-c Projects that contain or may impact endangered and/or threatened plant or animal species, as officially designated by the California Fish and Game Commission and/or the U. S. Fish and Wildlife Service, shall be designed or conditioned to avoid any net adverse project impacts on those species.

Siskiyou County

Siskiyou County is currently in process of updating its 1973 General Plan. The 1973 Conservation Element contains the following objective and associated policies appliable to the Proposed Project:

- Objective: To preserve and maintain streams, lakes, and forest open space as a means of providing natural habitat for species of wildlife.
    - To maintain all species of fish and wildlife for their intrinsic and ecological values as well as for their direct benefit to people.
    - To provide for diversified recreational use of fish and wildlife.
    - When planning any alteration to the present environment or habitat, consideration should be given to the effects on fish and wildlife.
    - Present land uses that result in siltation or pollution of inland waters should be carefully monitored, and if necessary, corrected to ensure clean and productive habitat.
    - Outstanding wildlife habitats and sites that have unusually high value for fish and wildlife should be carefully considered before any development altering this [sic] environment is permitted.

4.4.3 Impacts and Mitigation Measures

Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

4.4.3.1 Aquatic Species

Potential effects of the Proposed Project on BMI, aquatic mollusks, fish, amphibians and aquatic reptiles are discussed below. Additional information on potential environmental impacts on aquatic resources can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*, pages 127 through 166.

Benthic Macroinvertebrates

There are no BMI species that have been identified as a candidate, sensitive, or special status species in the Proposed Project area; therefore, no impact would occur on candidate, sensitive, or special status BMI species.

Aquatic Mollusks

There are no aquatic mollusk species that have been identified as a candidate, sensitive, or special status species in the Proposed Project area; therefore, no impact would occur on candidate, sensitive, or special status aquatic mollusk species.

Fish

Hardhead and reintroduced winter-run Chinook salmon eggs and the subsequent salmon juveniles are the only special status fish species present in the Proposed Project area. Hardhead are present in Pit 6 and Pit 7 Reservoirs and Pit 7 Afterbay.

Proposed Project operation and construction activities raise the possibility of a potential impacts to habitat for hardhead and reintroduced winter-run Chinook salmon, particularly by altering the water temperature or other potential habitat factors, such as the amount of physical habitat available due to flows, flow fluctuations, gravel and LWD availability, and water quality (e.g., turbidity). Proposed Project maintenance/construction activities could also affect aquatic habitats by degrading water quality. For example, ground-disturbing activities could result in increased erosion and sedimentation within the reservoirs and creeks. Fuels from construction vehicles or other equipment, or chemicals from the spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality. The Proposed Project requires herbicide application methods to be designed to avoid sensitive aquatic habitats. Measures contained in the Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management) and Stormwater Pollution Prevention Plan (SWPPP) will minimize the potential for degradation of aquatic habitats through the treatment and monitoring of erosion sites, implementation of water quality BMPs, and obtaining and implementing agency permits for construction projects that affect aquatic habitats (refer to Section 4.5, Hydrology and Water Quality). With the implementation of these components of the Proposed Project, potential adverse impacts to aquatic habitat as a result of operations and maintenance/construction activities would be less than significant.

The Proposed Project would result in the continued operation of the Pit 7 and Pit 6 Reservoirs, Pit 7 Afterbay, and continued MIF release of 150 cfs to the Pit River below Pit 7 Dam when Shasta Lake is lower than 1,055 feet msl, which would maintain existing water temperature and physical habitat conditions for hardhead.

Implementation of USFS 4(e) Condition 19 and SWB 401 Certification Condition 1, Minimum Instream Flows and Ramping Rates would increase MIFs from McCloud Dam into the Lower McCloud River reach which would benefit and/or have a neutral effect on the amount of physical aquatic habitat available for reintroduced winter-run Chinook salmon.

The implementation of down ramping of spill events, once controllable, and the minimum flow step-change requirements in the Lower McCloud River as required in the USFS 4(e) Condition 19 would help minimize stranding of aquatic biota. The effect on reintroduced Chinook salmon eggs/juveniles would be neutral as the ramping and step-change requirements occur in the spring, typically before the sensitive Chinook salmon life stages (eggs/fry) are in the river.

The USFS 4(e) Condition 21 Large Woody Debris Management Plan and 23 Coarse Sediment Management Plan) and SWB 401 certification conditions(4 Large Woody Material and 6 Gravel Augmentation) would place coarse sediment (gravel) and LWD in the McCloud River downstream of McCloud Dam. The gravel and LWD would improve aquatic habitat for winter-run Chinook salmon juveniles.

Slightly increased minimum flows in the Lower McCloud River during July and August, under the Proposed Project, 215 cfs versus 200 cfs in normal years and 160 in dry years, would result in slightly cooler water temperatures farther downstream (Figure 4-2). The additional cooler habitat would be beneficial to cold water salmonids, including winter-run Chinook salmon juveniles. In September the Proposed Project modified minimum flows are lower in normal years (200 cfs versus 210 cfs) and higher

in dry years (200 cfs versus 180 cfs). Based on a flow and water temperature analysis using modeling data available for September in PG&E (2009b), on average, there would be essentially no change in river miles of habitat below 12°C (Figure 4-4). The temperature at the confluence with Shasta Lake would be slightly cooler in the dry years and about the same in normal years (Figure 4-5). The modified MIFs would have a neutral effect on coldwater fish habitat (winter-run Chinook salmon) and a neutral effect on water temperature habitat for predator species such as bass potentially in the river near the confluence with Shasta Lake. There would be no change in predator (e.g., bass) distribution.

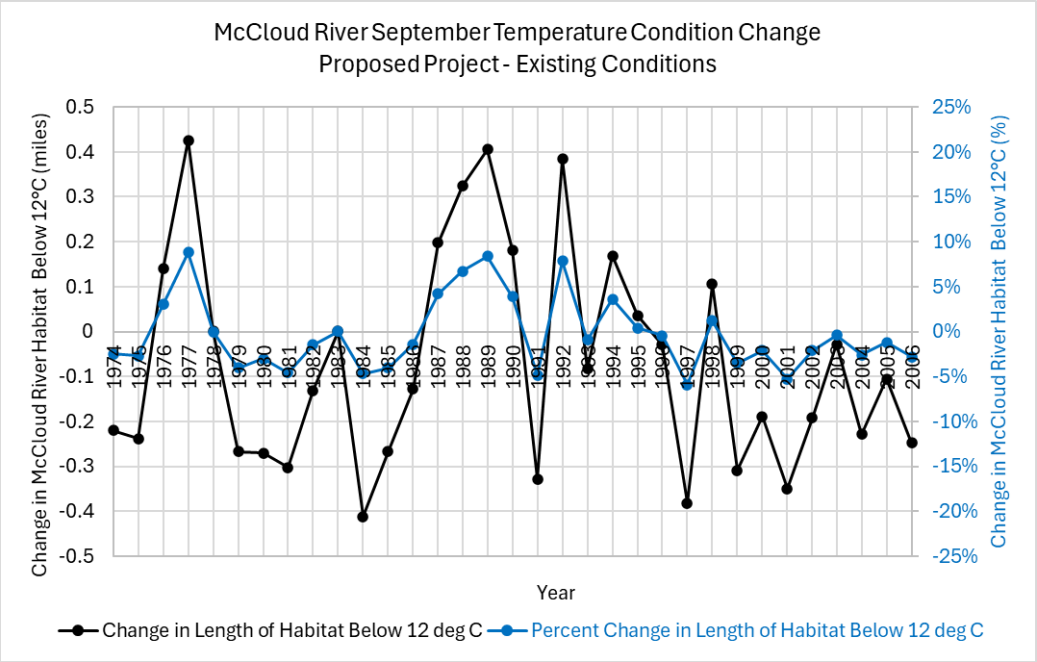


Figure 4-4. September change in McCloud River length in miles (black) and percent (blue) of habitat below 12°C due to the Proposed Project minimum flows (1974-2006).

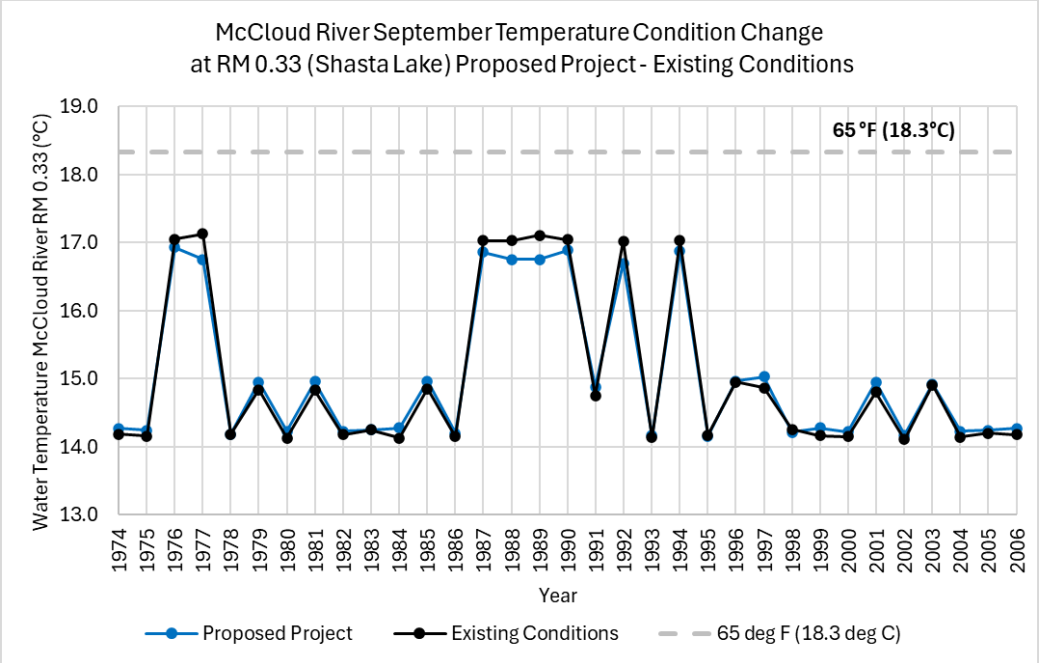


Figure 4-5. McCloud River September water temperature at RM 0.33 (at the confluence with Shasta Lake) under Exisiting Conditions and the Proposed Project.

The MIFs have a neutral effect on episodic turbidity events that occur in the Lower McCloud River (see Section 3.5 Hydrology and Water Quality). Turbidity during the summer/fall in the Lower McCloud River, however, is high and potentially exacerbated by the existing Hydroelectric Project and the Proposed Project would have an uncertain, but potentially significant effect on turbidity in the Lower McCloud River (Section 4.5.3.6 Turbidity). This would reduce the amount (duration) of clearwater habitat for reintroduced Chinook salmon eggs/juveniles, which could affect growth and survival. Mitigation measures MM Water-1 and MM Water-2 (as described in the Hydrology / Water Quality Section) would address this issue.

Implementation of the Aquatic Biological Monitoring Plan (4(e) Condition 27), Erosion and Sediment Control Management Plan (4(e) Condition 22), Water Quality and Temperature Monitoring Plan (4(e) Condition 20), applicable BMPs, and required agency permits would continue to support the existing habitat in the reservoirs and Proposed Project-affected river reaches and protect aquatic habitat during construction (e.g., recreation facilities) and maintenance activities.

Overall, the Proposed Project would have no impact on hardhead or hardhead habitat but would have potentially significant impacts on reintroduced winter-run salmon eggs/juveniles and their habitat due to turbidity. Potential water temperature and turbidity related impacts are discussed in Section 4.5, Hydrology and Water Quality. Implementation of MM WATER-1 and MM WATER-2 would be required to address the potential significant impact of the Proposed Project on salmon eggs and juveniles related to turbidity.

Other fish species that are currently present in the Proposed Project area, such as rainbow and brown trout, could also be affected by operations of the Proposed Project that affect the amount of physical habitat, stranding rates, coarse sediment recruitment and movement, LWD supply, water temperature, and water quality (e.g., turbidity).

Implementation of Proposed Project increased MIFs from McCloud and Iron Canyon Dams into their respective downstream reaches and continued MIF release of 150 cfs to the Pit River below Pit 7 Dam

when Shasta Lake is lower than 1,055 feet msl would benefit the amount of physical habitat for these species. In addition, implementation of spill down ramping rates and MIF step releases would reduce fish stranding.

The Proposed Project USFS 4(e) 21 (Large Woody Debris Management Plan) and SWB 401 certification condition 6, Gravel Augmentation, would place coarse sediment (gravel) and LWD in the McCloud River downstream of McCloud Dam that would improve fish habitat. Water temperature during the summer would be slightly cooler farther downstream in the Lower McCloud River due to slightly increased minimum flows, which would benefit fish habitat. The modified minimum flows would likely have neutral effects on episodic turbidity events (see Section 3.5 Hydrology and Water Quality) but as discussed above Implementation of MM WATER-1 and MM WATER-2 would be required to address the potential significant impact of the Proposed Project on clearwater fish habitat.

With implementation of the above components of the Proposed Project and the Aquatic Biological Monitoring Plan, Erosion and Sediment Control Management Plan, Water Quality and Temperature Monitoring Plan, applicable BMPs, required agency permits, the impact on fish habitat and fish species in the Proposed Project area would be less than significant with mitigation.

Amphibians

Northwest/North Coast clade FYLF are a California species of special concern. They were observed at seven sites (and associated tributaries) in the Proposed Project-affected Lower McCloud River reach between RM 1.4 and RM 5.7. Pacific tailed frogs, a California species of special concern, were found in a tributary to the Lower McCloud River, but not in a reach that could be affected by the Proposed Project.

The Proposed Project maintenance/construction activities could affect FYLF directly or aquatic habitats by degrading water quality. For example, ground-disturbing activities could result in increased erosion and sedimentation within the reservoirs and creeks. Fuels from construction vehicles or other equipment, or chemicals from the spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

The Proposed Project requires environmental training for Proposed Project staff on special status species. The Proposed Project also requires herbicide application methods to be designed to avoid sensitive aquatic habitats. Measures contained in the Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management) and SWPPP will minimize the potential for degradation of aquatic habitats through the treatment and monitoring of erosion sites, implementation of water quality BMPs, and obtaining and implementing agency permits for construction projects that affect aquatic habitats (refer to Section 4.5, Hydrology and Water Quality). With the implementation of these components of the Proposed Project, potential adverse impacts to FYLF and their aquatic habitat as a result of maintenance/construction activities would be less than significant.

Operation of the Proposed Project could impact water temperature and the physical habitat for FYLF in the downstream reach of the Lower McCloud River. For example, increased MIFs could reduce water temperature below those acceptable for development of tadpoles, or out-of-season flow fluctuations (high or low) could scour or desiccate egg masses or tadpoles.

The Proposed Project implementation of the USFS 4(e) Condition 19 Minimum Streamflow Requirements and Measurement, and SWB Condition Minimum Instream Flows and Ramping Rates from McCloud Dam downstream would slightly cool water temperature in the river (see Section 4.5.3.7 Water Temperature). For example, in August 12˚C cold water would extend downstream approximately an additional 1.2 miles

(RM 13) in a dry year with flows changing from 160 cfs to 215 cfs in July and August under the Proposed Project. The water temperature in the river would warm as it flows approximately 15 miles downstream to the locations where FYLF were observed during relicensing studies (RM 5.7; e.g., 14°C). The water temperature would be slightly cooler than existing conditions. In normal years (most years) the change in July and August flows is smaller, 200 cfs to 215 cfs, and the change in water temperature would be small. This cooler water temperature could slightly reduce the amount of FYLF rearing habitat in the lower river, the effects, however, are expected to be less than significant.

The Proposed Project Coarse Sediment Management Plan (USFS 4(e) Condition 23 Coarse Sediment Management Plan and SWB Final 401 Condition 6 Gravel Augmentation) and Large Woody Debris Plan (USFS 4(e) Condition 21 and SWB Final 401 Certification Condition 4 Large Woody Material) would place coarse sediment (gravel) and LWD in the McCloud River downstream of McCloud Dam. The placement of gravel and LWD in the channel would not be detrimental to the quality or amount of FYLF breeding or rearing habitat.

Increased whitewater flows, 300 cfs, below McCloud Dam as part of PG&E proposed boating flows May 15 - June 15 could have an adverse effect on FYLF breeding and tadpoles. If flows below McCloud Dam have decreased to 200 cfs prior to implementation of the boating flows, then the increased flows (300 cfs) for boating during the FYLF breeding season (beginning approximately May 15) could result in the egg masses deposited at 200 cfs being scoured and tadpoles being flushed downstream. Mitigation measure MM BIO-1 would be required to mitigate this impact to less than significant.

If initiation of the boating flows occurred prior to breeding, there would be no impact as the flows (300 cfs) would be within the natural range of flows and breeding / tadpole rearing would not be occurring in the river. Also, if the flows were near 300 cfs or greater prior to implementation of the boating flows, then boating flows would not affect FYLF breading. The boating flows are low enough that both the ramp up and ramp down (approximately 100 cfs) would be small enough to minimize potential stranding of aquatic biota. With implementation of MM BIO-1 the Proposed Project impacts to FYLF and their habitat in the Proposed Project area would be less than significant with mitigation.

Aquatic Reptiles

Northwestern pond turtles are a proposed federally threatened and California species of special concern. They were identified in Pit 6 and Pit 7 Reservoirs, as well as along the Lower McCloud River.

Northwestern pond turtles, if nesting or overwintering in uplands surrounding these reservoirs, could potentially be directly affected by activities that involve ground disturbance and vegetation removal including, but not limited to, construction of new recreation facilities or Proposed Project maintenance activities such as road grading, slide removal, roadside vegetation removal, fuels management, or other ground-disturbing activities. Proposed Project maintenance/construction activities could also affect aquatic habitats for the northwestern pond turtle by degrading water quality. For example, ground-disturbing activities could result in increased erosion and sedimentation within the reservoirs and creeks. Fuels from construction vehicles or other equipment, or chemicals from the spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

The Proposed Project requires environmental training for Proposed Project staff on special status species, including the northwestern pond turtle; requires herbicide application methods to be designed to avoid sensitive habitats, including aquatic and wetland habitats; and requires development of a Biological Evaluation (BE) for construction of new facilities that may affect northwestern pond turtle. The Proposed Project Aquatic Biological Monitoring Plan (USFS 4(e) Condition 27 and SWB Final 401 Condition 7 Biological Resources) will include surveys, monitoring, and preconstruction surveys within suitable habitat for the northwestern pond turtle along the Proposed Project reservoirs, and monitoring reports will be

submitted to USFS and discussed at the Annual Consultation Meeting. Measures contained in the Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management) and SWPPP will minimize the potential for degradation of aquatic habitats for northwestern pond turtle through the treatment and monitoring of erosion sites, implementation of water quality BMPs, and obtaining and implementing agency permits for construction projects that affect aquatic habitats (refer to Section 4.5, Hydrology and Water Quality). With the implementation of these components of the Proposed Project, potential adverse impacts to northwestern pond turtles as a result of operations and maintenance/construction activities would be less than significant.

Changes in MIFs (US Forest Service 4(e)) and PG&E proposed boating flows (300 cfs, 7 days, May 15 – June 15) could potentially affect northwestern pond turtle nesting sites near the Lower McCloud River shoreline through inundation, however, the minimum flows and boating flows are within the seasonal hydrograph (higher in the spring, lower in the summer). Nesting in spring and early summer would occur in habitats that would be experience inundation. Placement of LWD in the Lower McCloud River may potentially benefit western pond turtle habitat quality, quantity, and increase the number of basking sites. Overall, the Proposed Project is expected to have less than significant effects on northwestern pond turtles and their habitat.

Summary

The Proposed Project would potentially significantly affect special status aquatic species, but with implementation of Mitigation Measure BIO-1 the impact would be less than significant.

Impact: Less Than Significant with Mitigation

Mitigation Measures:

Mitigation Measure BIO-1: Whitewater Flow Seasonality. Whitewater boating flow releases below McCloud Dam, e.g., 300 cfs or greater, shall occur only during the winter/spring high flow season (i.e., consistent with natural high flow hydrology timing) and shall be only initiated prior to FYLF breeding season:

- The initiation of boating flows shall occur before FYLF breeding occurs (e.g., May 15th, depending on the water year type).
- Monitoring of the initiation of FYLF breeding shall occur by PG&E in the vicinity of FYLF monitoring Site 120. Monitoring shall occur during the first three years of whitewater boating flows to verify that FYLF breeding is not occurring prior to commencement of whitewater boating flows and to develop initiation of FYLF breeding timing data to guide implementation of future whitewater boating flows.

4.4.3.2 Terrestrial Species

Additional information on environmental impacts on terrestrial resources can be found in FERC's final EIS (FERC 2011), Section 3.3.3.2, *Environmental Effects*, pages 182 through 218; and in Section 3.3.4, *Threatened and Endangered Species*, pages 221 through 227.

Special Status Plants

Seven plant species ranked as CRPR 1, 2, or 3 are known to occur within the Proposed Project area (Appendix D). Of these, only two, Shasta eupatorium and Howell's lewisia, may potentially be affected by

Proposed Project activities. The Proposed Project may also affect other special status plant populations, if identified during comprehensive surveys required under the new license.

As a result of increased MIFs below the McCloud Dam, five Shasta Ageratina (*eupatorium*) individuals located on bedrock below the high-water mark of the Lower McCloud River may be inundated. The proximity of this population to a second known population of 20 to 30 individuals along Forest Road 38N11 above the high-water mark suggests the two populations are part of a larger metapopulation that fluctuates in extent over time.

Populations of Howell's lewisia in the vicinity of the Lower McCloud River may be directly affected by ongoing maintenance and recreational activities at Lower McCloud River whitewater (boating) put-in, McCloud Dam to Hawkins Creek Crossing whitewater access, and the Lower McCloud River Dispersed Recreation Site whitewater access.

Potential effects to special status plants and their habitat result from ground disturbance associated with improvements to existing facilities, construction of new facilities, and ongoing maintenance, including road grading, vegetation trimming or clearing, and herbicide spraying. Invasive plants, if established or spread by construction activities, also have the potential to affect special status plants. A total of 65 species of invasive plants were identified during botanical surveys. Populations are generally correlated with highly disturbed areas. Proposed operations and maintenance, recreation, or proposed construction activities may therefore facilitate the establishment or spread of weeds in the Proposed Project area. The spread and introduction of invasive plant species could degrade habitats for and compete with special status plants.

Implementation of all the Proposed Project, including environmental components, will not result in significant impacts to special status plants. PG&E will conduct annual training in coordination with USFS to familiarize Proposed Project staff with special status species, invasive plants, and applicable avoidance and protection measures. In addition, the Proposed Project includes implementation of the Vegetation and Invasive Weed Management Plan. USFS Final Section 4(e) Condition 25 requires the development of a Vegetation and Invasive Weed Management Plan. The Vegetation and Invasive Weed Management Plan has been incorporated into the Proposed Project submitted to the SWB for certification and will establish overall management and monitoring actions to protect and encourage native vegetation establishment on Proposed Project-affected lands, minimize invasive weeds, and manage vegetation that affects Proposed Project facilities. Under condition 25 in the USFS Final Section 4(e) Conditions, the Vegetation and Invasive Weed Management Plan will include, but may not be limited to the following components:

- Protection of special status and revegetation source populations.
- Invasive species management and monitoring, including an adaptive management element to implement methods for prevention of aquatic invasive weeds, as necessary.
- Revegetation implementation and monitoring.
- Treatment protocols for vegetation management and hazard reduction for protection of Proposed Project facilities and Proposed Project-affected resources within the Proposed Project-affected area.
- Pesticide/herbicide use approval and restrictions.
- Botanical enhancements for specific special status wildlife species.

In addition, the Vegetation and Invasive Weed Management Plan will include an adaptive management element which may include, but may not be limited to, public education and signing of public boat access and preparation of an Aquatic Plant Management component of the plan.

The protective measures in the Vegetation and Invasive Weed Management Plan (USFS Final Section 4(e) Condition 25) do not address the potential for inundation of the small population of Shasta Ageratina located along the Lower McCloud River below the dam. However, potential impacts to the five individuals in this population would be considered less than significant for several reasons. Shasta Ageratina is a limestone endemic with a range restricted roughly to the STNF. The 1995 STNF Land and Resource Management Plan notes that this species is known to occur in suitable limestone habitats within the McCloud and Shasta ranger districts, and that it was removed from the Regional Forester's list of sensitive species prior to 1993.

Furthermore, Shasta Ageratina may co-occur with the Shasta salamander, which is another limestone endemic species. Therefore, measures to protect the Shasta salamander, described in the subsequent section, may also protect Shasta Ageratina and its limestone habitat.

With implementation of the Vegetation and Invasive Weed Management Plan, impacts to special status plants would be less than significant. The Plan would establish overall management and monitoring actions to protect and encourage native vegetation establishment on Proposed Project-affected lands and ensure control and monitoring of known populations of invasive weeds. USFS Region 5 Invasive Species BMPs could also be implemented as part of the Vegetation and Invasive Weed Management Plan. With the implementation of Proposed Project, including these Environmental Components, potential adverse impacts to special status plants would be less than significant.

Special Status Wildlife

Valley Elderberry Longhorn Beetle

The Proposed Project area supports elderberry shrub habitat for VELB. However, based on revisions to the species' range (USFWS 2014), the Proposed Project is no longer in the range for VELB. Therefore, the Proposed Project would have no impact on VELB or its habitat.

Shasta Salamander

Shasta salamanders are known to occur in limestone rock outcrops and other non-limestone habitats in the vicinity of the McCloud Reservoir and the Pit 7 Afterbay. This species or its habitat could be affected by activities that cause ground disturbance in previously undisturbed areas, particularly during the reproductive season. Specifically, improvements to existing recreation facilities and construction of new recreation facilities in the vicinity of McCloud Reservoir and Pit 7 Afterbay could directly affect salamander individuals or destroy or alter suitable habitat. Ongoing maintenance activities at existing facilities that could potentially affect Shasta salamanders include road grading, slide removal, roadside vegetation removal, spraying of herbicides, hazard tree removal, and other ground-disturbing activities that may encroach into the steep-cut slopes along dirt roads that border the reservoirs or the limestone caves on the west shore of McCloud Reservoir near the Battle Creek inlet.

Activities which could directly affect individual Shasta salamanders or their habitat would be reduced through implementation of a Terrestrial Biological Management Plan (USFS 4(e) Condition 26) and Biological Resources Monitoring Plan (SWB Final 401 Certification Condition 7 Biological Resources). These plans require preconstruction surveys prior to ground disturbance, avoidance of potential and occupied habitat, or relocation of individuals to nearby suitable habitat.

In addition, potential impacts to Shasta salamanders from herbicide application would be reduced through implementation of the Vegetation and Invasive Weed Management Plan, which will require herbicide application treatment methods to be designed by licensed PCAs and in consideration of site-specific conditions and the location of suitable habitats for special status wildlife, including seeps or other features used by Shasta salamanders. PG&E will also implement applicable USFS Region 5 and PG&E BMPs, including BMPs to minimize effects of ground-disturbing activities to seeps and other water bodies. Implementation of the Proposed Project, including these Environmental Components, will not result in significant impacts to Shasta salamander.

American Goshawk

Although no active nests were identified during surveys conducted for the relicensing, American goshawks were observed in the Proposed Project area, and this species is assumed to be present in suitable habitat in the Proposed Project area. American goshawks are known to be sensitive to disturbance during their reproductive period (February 15 through September 15). Noise and human disturbance associated with the construction of new Proposed Project facilities or recreation facilities, expansion of existing recreation facilities, and routine maintenance of Proposed Project facilities or recreation facilities could affect American goshawks potentially nesting in the Proposed Project area.

Implementation of all components of the Proposed Project will not result in significant impacts to American goshawk. PG&E would conduct environmental training for staff on special status species, including American goshawk. In addition, the Terrestrial Biological Management Plan would require PG&E to conduct preconstruction surveys prior to the start of disturbance along the Lower McCloud River corridor. If nests are identified, a limited operating period would be in place from February 1 to August 15 within 300 acres around the nest. The Terrestrial Biological Management Plan would also require monitoring of known nests every ten years and comprehensive surveys within all suitable habitat once every ten years during the license term. Implementation of the Proposed Project, including these Environmental Components, will not result in significant impacts to American goshawk.

American Peregrine Falcon

American peregrine falcon breeding activity was observed during surveys at five eyries in large rock outcroppings high above the McCloud River, Iron Canyon Creek, Pit 7 Reservoir, and Pit 6 Reservoir. American peregrine falcons are sensitive to disturbances during the breeding season (January through August) and are especially susceptible to disturbance during the onset of courtship (January through March). Disturbance could include noise (e.g., sirens, use of machinery, or blasting) or human disturbance associated with construction, expansion, or maintenance of Proposed Project or recreation facilities. Recreational activities such as motorized boating could also disturb breeding peregrine falcons.

Impacts to peregrine falcon would be reduced through implementation of the following environmental components. PG&E would conduct environmental training for staff on special status species, including peregrine falcon. In addition, the Terrestrial Biological Management Plan would require PG&E to restrict non-emergency activities that could disturb active nests at these five locations between February 1 and August 15. In the event this restriction is infeasible, PG&E would conduct preconstruction surveys to observe and monitor active nests. The Terrestrial Biological Management Plan would also require annual monitoring of known peregrine falcon breeding territories and comprehensive surveys within all suitable habitat once every ten years during the license term. Implementation of the Proposed Project, including these environmental components, would not result in significant impacts to peregrine falcon.

Bald Eagle

There are eight bald eagle nesting territories in the Proposed Project area, including one at McCloud Reservoir, three along the Lower McCloud River, two at Iron Canyon Reservoir, one at Pit 7 Afterbay, and one at Pit 6 Reservoir. Proposed Project activities that could potentially result in disturbance to active nests include construction of new recreation facilities, expansion of existing recreation facilities, routine maintenance of Proposed Project facilities or recreation facilities, and recreational use at new facilities. Recreational use at existing recreation facilities, including recreational boating on the reservoirs, is not expected to disturb nesting eagles because the eagles have historically tolerated such activities.

Proposed Project maintenance activities could also affect aquatic foraging habitats for bald eagle by degrading water quality, which could in turn affect prey species (e.g., fish). For example, ground-disturbing activities could result in increased erosion and sedimentation in the reservoirs and creeks. Fuels from construction vehicles or other equipment, or chemicals from spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

Proposed Project operations are not expected to significantly affect prey availability for bald eagles because Proposed Project reservoirs will continue to provide suitable foraging opportunities. The McCloud and Iron Canyon Reservoirs are regularly stocked with suitably sized salmonids. However, increased flows below McCloud Dam could affect salmonid juveniles if they occur out-of-season (e.g., summer) or if downramping rates strand aquatic species (refer to discussion under aquatic species above).

Under the Proposed Project, PG&E would conduct environmental training for staff on special status species, including bald eagle. The USFWS National Bald Eagle Management Guidelines (Guidelines) (USFWS 2017) provide activity-specific management recommendations for avoiding bald eagle disturbance in the vicinity of bald eagle nests. The Guidelines recommend a 660-foot buffer around active nests for construction projects with a footprint of half an acre or greater, tree removal, and road construction activities; a 1,000-foot buffer for use of helicopters and fixed-wing aircraft (except for authorized biologists trained in survey techniques); and a half mile buffer for blasting. These buffer distances would be applied during Proposed Project activities.

In addition, the Terrestrial Biological Management Plan would require PG&E to restrict non-emergency activities that could disturb active nests between January 1 and August 1. The Terrestrial Biological Management Plan would also require annual monitoring of known bald eagle territories (following survey protocols described in the FERC license for the Pit 3, 4, and 5 Hydroelectric Projects). In addition, comprehensive surveys will be conducted within all suitable habitats once every ten years during the license term. Results of surveys and monitoring, including the breeding status of known nests and any adverse reactions to Proposed Project activities, will be provided to USFS 30 days prior to the Annual Consultation Meeting. If it is determined that the Proposed Project is affecting breeding or foraging eagles, new or additional measures will be developed and implemented in consultation with USFS. Implementation of the Proposed Project, including Environmental Components, would not result in significant impacts to bald eagle.

Northern Spotted Owl

Although no northern spotted owls or nests were identified during studies conducted for the relicensing, this species is assumed to be present in suitable habitat in the Proposed Project area. Northern spotted owls are known to be particularly sensitive to human disturbance and habitat alterations during their reproductive period (February 15 through September 30). Prolonged disturbance can reduce the ability for owls to detect prey, disrupt flight responses, reduce nest attentiveness, and decrease the rate of food delivery to the nest. Noise disturbance and human presence associated with construction of new

recreation facilities; expansion of existing recreation facilities; and routine maintenance of Proposed Project facilities or recreation facilities could affect northern spotted owl potentially nesting in the Proposed Project area.

Potential impacts to northern spotted owl would be reduced through the following environmental components. PG&E would conduct environmental training for staff on special status species, including northern spotted owl. The Terrestrial Biological Management Plan would require PG&E to restrict non-emergency activities that could disturb active nests between February 15 and July 10. In the event this restriction is infeasible, PG&E would conduct preconstruction surveys to observe and monitor active nests. Implementation of the Proposed Project, including Environmental Components, would not result in significant impacts to northern spotted owl.

Willow Flycatcher

Although no nesting willow flycatchers were observed in the Proposed Project area, non-territorial individuals were detected at the Iron Canyon Reservoir and Fenders Flat/Pit 7 Afterbay Dam survey areas. Construction of new Proposed Project facilities or recreation facilities, expansion of existing recreation facilities, and routine maintenance of Proposed Project facilities or recreation facilities could disturb willow flycatcher (or other neo-tropical migrants) during the migratory period (late April through early June) and reproductive period (mid-May through mid-September). Disturbance could cause individuals to abandon suitable nesting territories or nests. In addition, Proposed Project operations resulting in fluctuating reservoir elevations in Iron Canyon Reservoir and changes in Pit River flows could result in loss of appropriate riparian habitat.

Under the Proposed Project, PG&E would conduct environmental training for staff on special status species, including willow flycatcher. In addition, the Terrestrial Biological Management Plan would require PG&E to conduct preconstruction surveys within 250 feet of suitable willow flycatcher habitat prior to disturbance between May 1 and August 1. If breeding birds are present, no routine activities would be permitted within 250 feet of the nest, unless approved by agencies. The Terrestrial Biological Management Plan would also require monitoring of known nests every ten years and comprehensive surveys within all suitable habitat once every ten years during the license term. Implementation of the Proposed Project, including Environmental Components, would not result in significant impacts to willow flycatcher.

Bats

Five special status bats, including pallid bat, spotted bat, Townsend's big-eared bat, western red bat, and western mastiff bat, are present in the Proposed Project area. Alterations to Proposed Project facilities that provide roosting habitat could affect roosting or hibernating bats. Vegetation management activities, such as fuels treatment or removal of hazard trees, may affect tree-roosting bat species. Proposed Project maintenance activities could increase erosion and sedimentation within the reservoirs and creeks and degrade water quality, which could affect bat prey species (e.g., aquatic macroinvertebrates). Fuels from construction vehicles or other equipment, or chemicals from spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality.

Under the Proposed Project, PG&E would conduct environmental training for staff on special status species, including bats. In addition, the Terrestrial Biological Management Plan would require PG&E to conduct preconstruction surveys in suitable bat habitat prior to disturbance during the breeding season (May 1 through August 31). Active roosts would be protected with a buffer of 500 feet. Bat biologists would be consulted prior to removal of bats, modification of roosting structures, or installation of exclusion devices. The Terrestrial Biological Management Plan would also require monitoring of known roosts every

ten years and comprehensive surveys within all suitable habitat once every ten years during the license term.

In addition, environmental components related to herbicide application would require avoidance of sensitive habitats, including aquatic foraging habitats for bats. Water quality BMPs would require treatment and monitoring of erosion and obtaining and implementing agency permits for construction projects that affect aquatic habitats. Proposed Project operations will not significantly affect prey availability for foraging bats because implementation of Proposed Project increased minimum flows, ramping rates, and aquatic habitat monitoring and management plans are expected to maintain and/or potentially benefit aquatic benthic macroinvertebrate habitat and abundance. Implementation of the Proposed Project, including Environmental Components, would not result in significant impacts to special status bats.

Fisher

Proposed Project activities could disturb forest carnivores, including fisher, as a result of noise, human activity and disturbance, ground disturbance, and vegetation removal, particularly trees or snags that could support dens.

Impacts to special status bats would be reduced through implementation of the following environmental components. PG&E would conduct environmental training for staff on special status species, including fishers and other mesocarnivores. In addition, the Terrestrial Biological Management Plan would require preconstruction surveys no greater than 30 days prior to construction activities within suitable habitat for fisher or other forest carnivores. If any dens are present, avoidance and protection measures would be developed and implemented, if determined necessary, through consultation with USFS. With the implementation of these environmental components, potential adverse impacts to fishers as a result of Proposed Project construction and operation would be less than significant.

Summary

The Proposed Project will not result in significant impacts to special status species if Mitigation Measure BIO-1: Whitewater Flow Seasonality is implemented.

Impact: Less Than Significant

Mitigation Measures: BIO-1: Whitewater Flow Seasonality

Impact BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

Riparian Habitat

For the purposes of this element, effects on riparian habitat or other sensitive natural communities would be considered substantial, and thus significant, if the effect resulted in the long-term loss of more than ten percent of the habitat in question or resulted in permanent fragmentation of habitat.

Riparian habitat in the Proposed Project area could potentially be affected by operations or by other activities that require vegetation removal, including construction of new recreation facilities, improvements to existing facilities and recreation facilities, or vegetation management activities, such as fuels

management or hazard tree removal. The potential effects of the Proposed Project operations and construction, and vegetation management are described and analyzed below.

Additional information on environmental impacts on riparian resources can be found in FERC's final EIS (FERC 2011), Section 3.3.3.2.1, *Vegetation*, pages 182 through 189.

Proposed Project Operations

The relicensing process included studies to determine potential effects of the Proposed Project operations on the Lower McCloud River downstream of McCloud Dam. Current large peak flows along the Lower McCloud River, which are similar to those under pre-Hydroelectric Project conditions, are flows that scour or 'reset' vegetation on gravel and cobble bars. Those studies demonstrate that implementation of the Proposed Project will not result in considerable alteration of the extent of mature riparian vegetation on geomorphic features within the stream channel. The lateral extent (or width) of riparian vegetation along stream channel banks will not appreciably change under the Proposed Project. The linear extent (or length) of riparian vegetation adjacent to the active channel would also remain unchanged.

Proposed Project Construction and Vegetation Management

Activities that require vegetation removal (e.g., construction of new recreation facilities, improvements to existing recreation facilities, or vegetation management activities including fuels management or hazard tree removal) could potentially result in removal of riparian habitat or impacts to sensitive natural communities. However, if the Proposed Project results in these potential impacts, they will not be significant because measures included in the Vegetation and Invasive Weed Management Plan (USFS Final Section 4(e) Condition 25) will minimize effects on sensitive habitats, restore (revegetate) disturbed areas following construction, guide the implementation of BMPs, and protect special status species, local revegetation sources, and botanical populations essential for wildlife habitat.

The Vegetation and Invasive Weed Management Plan will include measures to: control and monitor invasive weeds (including use of herbicides); restrict all disturbance within a 100-foot buffer of known populations of special status plant species; install protective fencing around sensitive botanical resources; alert maintenance crews of the location of sensitive resources; collect and salvage topsoil with seed stock (if appropriate); and develop site-specific revegetation plans for sites larger than 0.25 acre (which will require USFS approval). Annual USFS consultation on vegetation management will occur throughout the life of the license.

The Vegetation and Invasive Weed Management Plan would also require that impacted riparian and wetland areas be restored, or an equivalent area enhanced. Riparian vegetation greater than 4-inch diameter at chest height that is removed or damaged will be replaced with like species at a 3:1 ratio. Wetlands will be replaced at a 2:1 ratio. Consultation with CDFW and USACE may adjust the mitigation ratio. Revegetation sites will be monitored, and remedial actions taken annually, if necessary, until success criteria are met (according to site-specific Revegetation Plans) and attained for one year. If success criteria are not met after three years of monitoring and remediation measures, then sites will be evaluated and more substantial remedial measures will be implemented, and monitoring will occur for another two years, for a total of five years of monitoring.

With implementation of these components of the Proposed Project, impacts on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW, USACE or USFWS by Proposed Project activities would not be significant.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact BIO-3: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

State or Federally Protected Wetlands

For the purposes of this element, effects would be considered substantial, and thus significant, if the result was the long-term loss or conversion of protected wetlands or the violation of applicable standards adopted for the protection of wetlands.

Proposed Project-affected reservoirs and rivers, as well as their tributaries, are considered waters of the United States and are protected under the federal CWA. In addition, several wetlands were mapped in the Proposed Project area during vegetation mapping in support of the relicensing application. Construction of new recreation facilities or improvement of existing recreation facilities could potentially result in fill within waters of the United States. For example, the construction of four river/shoreline access facilities at McCloud Reservoir, two boat launches at Iron Canyon Reservoir, and one shoreline access facility at Pit 7 Reservoir could potentially require ground disturbance and fill below the waterline of those water bodies In addition, construction activities could potentially require work within jurisdictional drainages or wetlands that could result in adverse effects.

However, with implementation of the Vegetation and Invasive Weed Management Plan, which would include preconstruction surveys within all areas of proposed ground disturbance to determine the location of special status plants or their habitats, the impact would be less than significant. If wetlands or other waters of the United States are detected that would be affected by the proposed work, PG&E will obtain permits under the CWA and other authorizations, if required. All conditions and requirements of the permits will be included with construction specifications and implemented as part of the Proposed Project work.

In addition, applicable measures for the avoidance and protection of sensitive habitats, including wetlands, would be included in the Vegetation and Invasive Weed Management Plan (USFS Final Section 4(e) Condition 25), and implementation of required erosion control and water quality BMPs will further protect waters of the United States and/or wetlands during construction activities. These measures will be included in Proposed Project-specific BEs.

With the implementation of the Proposed Project, including these Environmental Components, impacts to wetlands and other waters of the United States would not be significant.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact BIO-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

For the purposes of this element, interference with the movement of species would be considered substantial, and thus significant, if a project altered migratory corridors or fishways in a manner than

prevented their use by the subject species; and impacts to native wildlife nursery sites would be considered significant if a project prevented use of the sites during the applicable nursery period.

Anadromous Species Passage

Recently (2022-2025), winter-run Chinook salmon eggs have been reintroduced to the McCloud River but currently no adult Chinook salmon have been reintroduced. Adults would not be transferred to the McCloud River until water treatment/sanitation upgrades have been completed at Livingston Stone National Fish Hatchery. NMFS, USFWS, BOR, and CDFW are pursuing these upgrades (Steve Edmondson, NMFS, Email 2/27/2025 to Craig Addley). As such, no listed adult anadromous salmonids would be expected to have access to the Lower McCloud River until upstream fish passage is implemented around the Keswick and Shasta dams, downstream of the Proposed Project. Since anadromous adults are not presently being transported into the Proposed Project area there would be no impact related to anadromous species upstream passage. Downstream passage of juvenile fish without human intervention (e.g., trapping and hauling) is precluded by Shasta Lake. The Proposed Project would not affect downstream fish passage.

Resident Fish Passage

FERC (2011) noted potential barriers to resident fish passage within the Proposed Project area related to non-Proposed Project roads. Nevares and Marine (2009 [TM 15]) conducted a survey of fish passage within the inundation zone of the Proposed Project reservoirs but found no impediments to the passage of brown or rainbow trout. However, Nevares and Marine (2009 [TM 15]) also noted the potential presence of fish passage impediments upstream of the reservoir fluctuation zone in tributaries to Iron Canyon Reservoir crossed by Forest Road 37N78 (non-Proposed Project road). At the road crossings, tributaries (McGill Creek, Deadlun Creek, Cedar Salt Log Creek, Little Gap Creek, and Gap Creek) flow through culverts that, in addition to potentially impeding migration of brown and rainbow trout, restrict flow and collect debris, further exacerbating passage problems. Also, some of the Proposed Project activities could temporarily obstruct fish passage through work areas, such as road improvements across creeks or the placement of gravel and LWD in the Lower McCloud River.

Proposed Project Environmental Components including the Aquatic Biological Monitoring Plan (USFS 4(e) Condition 27 Aquatic Biological Monitoring Plan and SWB Final 401 Condition 7 Biological Resources), Coarse Sediment Management Plan (USFS 4(e) Condition 23 Coarse Sediment Management Plan and SWB Final 401 Condition 6 Gravel Augmentation), Large Woody Debris Management Plan (USFS 4(e) Condition 21 and SWB Final 401 Certification Condition 4 Large Woody Material), and Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management), require fish passage to be maintained or restored immediately following construction. None of the Proposed Project activities would result in new permanent obstructions or barriers to fish passage through the Proposed Project area waters. The USFS 4(e) Conditions stipulate aquatic biological monitoring (Condition 27), including periodic monitoring of fish passage conditions at the above-listed tributaries to Iron Canyon Reservoir. Implementation of the Aquatic Biological Monitoring Plan would include identification and reduction of fish passage impediments in tributaries to Iron Canyon Reservoir. With the implementation of the Proposed Project, including these Environmental Components, potential impacts related to resident fish passage would not be significant.

Amphibians and Aquatic Reptiles

Maintenance, construction, and operations of the Proposed Project could potentially affect the movement of amphibians and aquatic reptiles (e.g., FYLF, northwestern pond turtle). The Proposed Project, however, requires environmental training for Proposed Project staff on special status species, including the northwestern pond turtle, and development of a BE for construction of new facilities that may affect

special status species, including the northwestern pond turtle. The Proposed Project Aquatic Biological Monitoring Plan will include surveys, monitoring, and preconstruction surveys within suitable habitat for amphibians and the northwestern pond turtle. Implementation of agency permits for construction projects that affect aquatic habitats would also protect native amphibians northwestern pond turtle. The increased minimum flow requirements, LWD and coarse sediment management measures are not expected to affect the movement of native amphibians or the special status northwestern pond turtle. However, increased whitewater flows (300 cfs or more) could potentially impact amphibians and aquatic reptiles. This would be a potentially significant impact. With implementation of MM BIO-1 impacts to native amphibians and northwestern pond turtle movement as a result of maintenance and construction activities and operations would be less than significant.

Fish Entrainment

Entrainment into hydroelectric facilities can injure or cause mortality to fish species. Nevares and Liebig (2009) examined entrainment potential from the McCloud Reservoir to the Iron Canyon Reservoir (through the McCloud Tunnel), from the Iron Canyon Reservoir to the James B. Black Powerhouse (through the Iron Canyon Tunnel), within the Pit 6 and Pit 7 powerhouses' turbines. Through tagging studies, analyses of swim speed versus approach velocities at intake structures, and assessment of potential survival through turbines, Nevares and Liebig (2009) found entrainment into the James B. Black, Pit 6, and Pit 7 intakes to be low. Fish would not survive through the James B. Black turbines, but survival through Pit 6 and Pit 7 turbines was likely to be quite high. Overall, Nevares and Liebig (2009) concluded that the potential of fish entrainment into existing Hydroelectric Project facilities was quite low. In addition, the Proposed Project facilities and operations are not significantly different compared to the existing facilities and operations; therefore, higher entrainment than baseline is not likely. Potential adverse impacts related to fish entrainment would be less than significant. Additional information on environmental impacts on fish passage can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*, pages 160 through 162.

Migratory Bird Movements

Transmission line structures provide perching, roosting, and nesting substrate for some avian species, especially for raptor species that inhabit open areas or habitats where natural structures are lacking (Avian Power Line Interaction Committee [APLIC] 2006). Avian interactions with transmission line structures can cause mortality through electrocution and can cause power outages and reduce transmission system reliability (APLIC 2006). However, if the Proposed Project results in these potential impacts, the impacts will not be significant. Existing Hydroelectric Project powerlines (James B. Black, Pit 6, and Pit 7) meet or exceed current APLIC-recommended standards, with the exception of several of the configurations associated with the above-ground portion of the Pit 5 1101 circuit distribution line. PG&E records have not documented any avian-caused outages or electrocutions/mortalities on Hydroelectric Project power lines. The Proposed Project, therefore, poses a low risk of avian electrocutions on power lines. In addition, implementation of the Terrestrial Biological Management Plan (USFS 4(e) Condition 26) will include measures that further minimize any risk of avian electrocution. This plan requires that PG&E review the list of power lines that are not in compliance with USFWS's Avian Protection Plan Guidelines and complete retrofits, as appropriate, within three years of FERC license acceptance. Given the low potential for power line-related effects and implementation of the Terrestrial Biological Management Plan, adverse impacts associated with migratory bird movements would be less than significant. Additional information on environmental impacts on migratory avian species can be found in FERC's final EIS (FERC 2011), Section 3.3.3.2.2, *Wildlife*, pages 209 through 215.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Shasta County General Plan and Siskiyou County General Plan contain policies to protect significant fish, wildlife, and vegetation resources and to balance wildlife habitat protection and enhancement with other resource management. The Proposed Project includes the implementation of various Environmental Components that will protect fish, wildlife, and plants in the Proposed Project area during the implementation of proposed activities.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact BIO-6: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No habitat conservation plans or natural community conservation plans are prepared for the Proposed Project area. The Proposed Project would have no impact.

Impact: No Impact

Mitigation Measures: None required.

4.5 HYDROLOGY AND WATER QUALITY

4.5.1 Environmental Setting

The Proposed Project is located in Northern California in the McCloud and Pit River drainages, along the western slope of the Cascade Range. The Proposed Project is entirely contained within the SR Hydrologic Region of California (DWR 2005a). The USGS has defined three hydrologic drainage basins within the Proposed Project vicinity. The basins and hydrologic unit codes for the Proposed Project vicinity are Upper Pit (18020002), Lower Pit (18020003), and McCloud (18020004) (USGS 2005). Within these hydrologic drainage basins, six study areas were identified for further description within the Proposed Project area: (1) McCloud Reservoir; (2) Lower McCloud River (McCloud Dam to Shasta Lake); (3) Iron Canyon Reservoir; (4) Lower Iron Canyon Creek (Iron Canyon Dam to Pit 6 Reservoir); (5) Upper Pit River (Pit 6 Reservoir to Pit 7 Reservoir); and (6) Lower Pit River (Pit 7 Dam and Pit 7 Afterbay to Shasta Lake) (Figure 2-1).

The McCloud River drainage basin lies within Siskiyou and Shasta Counties and has a total drainage area of approximately 581 square miles. The McCloud River originates southeast of Mt. Shasta at an elevation of approximately 5,500 feet and flows approximately 59 miles in a southwesterly direction through McCloud Reservoir before entering Shasta Lake and joining the SR. The Pit River basin is divided into the Upper Pit and the Lower Pit basins. The Upper Pit River basin lies within Modoc and Lassen counties and has a total drainage area of approximately 4,899 square miles. It originates from Goose Lake and flows southwesterly to the Fall River Valley, where it enters the Lower Pit River basin.

The Lower Pit River basin lies within Shasta County and has a total drainage area of approximately 238 square miles, exclusive of contributing areas from the Upper Pit or McCloud River basins. The Pit River flows southwesterly for approximately 150 miles before entering Shasta Lake and joining the SR.

Rivers and streams of the Proposed Project area are typically steep gradient and highly confined, resulting in minimal floodplain development. The largest flood event on record during the study period of 1974–2006 occurred in January 1997, when mean daily flow at the Ah-Di-Na gage downstream of McCloud Reservoir exceeded 25,000 cfs. The largest flood during the study period in the Pit River watershed occurred in February 1986, when mean daily flow at the gage downstream of Pit 7 Dam reached 49,000 cfs.

PG&E uses water at the Proposed Project for non-consumptive storage and power generation. PG&E also operates the Proposed Project in support of several other beneficial uses identified by (CVRWQCB 2018) for the McCloud River and the Pit River. The CVRWQCB's *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan)[16] identifies surface water bodies that drain into the upper Central Valley of California, including the McCloud River and Pit River, and specifies beneficial uses for each major river. The existing beneficial uses for McCloud River are municipal and domestic water supply, power production, contact and non-contact recreation (including swimming, wading, white water activities, and fishing), cold freshwater habitat, coldwater spawning, and wildlife habitat. Canoeing and rafting are identified as a potential beneficial use. The Pit River in the Proposed Project-affected reach (between James B. Black Tailrace and Shasta Lake) is designated for all of the existing beneficial uses designated for the McCloud River, as well as water supply for irrigation and stock watering and canoeing and rafting. Warm freshwater habitat and warmwater spawning are identified as potential beneficial uses.

Although the McCloud River is not listed under Section 303(d) of the CWA as an impaired water body, the Pit River (from the confluence of the north and south forks to Shasta Lake) is listed for aluminum, iron, nutrients, organic enrichment, dissolved oxygen, toxicity, and water temperature (USEPA 2018). The listing cites agriculture and grazing as the probable source of these impairments, and the river is currently listed as a low-priority river for the development of total maximum daily load standards (USEPA 2018, SWB 2024). Additional information on hydrology and water quality in the Proposed Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.2.1, *Affected Environment*, pages 89 through 117.

4.5.2 Regulatory Setting

4.5.2.1 Federal

Federal Clean Water Act

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Through cooperative federalism, responsibility for setting standards and issuing and enforcing permits is shared by the USEPA, USACE, states, and authorized tribes.

Under the CWA, NPDES permits are required for discharges of pollutants to navigable waters of the United States. These include any discharge to surface waters, such as lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under Section 402 of the CWA. (33 U.S.C. § 1342.)

[16] *Water Quality Control Plan for the California SE Central Valley Region for the Sacramento River Basin and the San Joaquin River Basin.* Fifth Edition. Revised May 2018 (with Approved Amendments).

Section 303

The State of California adopts water quality standards to protect beneficial uses of state waters, as required by Section 303 of the CWA (33 U.S.C. § 1313). Section 303(d) of the CWA requires states and authorized tribes to list impaired water bodies (i.e., water bodies that do not meet water quality standards) and establish corresponding Total Maximum Daily Loads for these impaired water bodies. The Pit River in the Proposed Project area is listed under Section 303(d) of the CWA for nutrients, organic enrichment, and water temperature (USEPA 2018, SWB 2024).

Section 401

Section 401 of the CWA (33 U.S.C. § 1341) requires applicants for a federal license or permit that may result in a discharge into navigable waters to provide the federal licensing or permitting agency a certification from the applicable state agency that the activity to be licensed or permitted will comply with federal and state water quality standards. A federal agency may not issue a license or permit without a certification or waiver from the state or authorized tribe where the discharge originates.

In California, the SWB is the state agency with regulatory authority to issue or deny water quality certifications for hydroelectric projects licensed by FERC. The conditions of a certification issued by the SWB become mandatory conditions in the FERC license for the Proposed Project.

Section 404

Section 404 of the CWA (33 U.S.C. § 1344) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404 requires that a permit be issued before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

U.S. Forest Service, Shasta-Trinity National Forest

As stated in the 1995 STNF Land and Resource Management Plan, the overall management philosophy is to realize integrated multiple resource land management in the context of Ecosystem Management. This goal is to be achieved through the implementation of an environmental agenda that has three major facets:

- **Preservation** – the protection of unique landscapes and their wild and scenic characteristics for the indefinite future.
- **Biodiversity** – at all ecosystem scales, the maintenance of a rich diversity of plants, fish, and wildlife.
- **Sustainable Development for People** – providing high quality recreational experiences, a long- term sustained yield of timber, forage and other resource products, and services consumed by society. This last facet will be compatible with the Preservation and Biodiversity goals.

Specific resource goals related to water are listed below:

- **Water** –

- 39. Maintain or improve water quality and quantity to meet fish habitat requirements and domestic use needs.
- 40. Maintain water quality to meet or exceed applicable standards and regulations.

Other relevant goals and policies related to the protection of wildlife and their habitats see Section 4.4.2.1.

4.5.2.2 State of California

Porter-Cologne Water Quality Control Act

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act, Wat. Code, § 13000 et seq.). The Porter-Cologne Act grants the SWB and each of the nine Regional Water Quality Control Boards (RWQCB) authority to protect water quality and is the primary vehicle for implementation of California's responsibilities under the CWA. This act grants the SWB and the RWQCBs authority and responsibility to adopt plans and policies, regulate discharges to surface and groundwater, regulate waste disposal sites, and require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substances, sewage, or oil or petroleum products. The SWB and the RWQCBs jointly administer federal and state laws related to water quality in coordination with the USEPA and USACE (SWB, 2019).

Basin Plan

The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region (CVRWQCB 2019) for the Sacramento and San Joaquin River Basins establishes water quality standards for all the ground and surface waters of the region. The Basin Plan designates the beneficial uses of water and water quality objectives needed to protect the identified beneficial uses. Thus, the term "water quality standards" encompasses both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The water quality objectives are designated in Section 3 of the Basin Plan (CVRWQB 2019)

4.5.2.3 Local

Shasta County

The 2004 Shasta County General Plan does not contain objectives and policies specific to water quality and hydrology. However, it does contain objectives and policies to address the need to preserve unique and important aquatic habitats, as well as for the direct and indirect benefits to the citizens of Shasta County. (County of Shasta 2004). Refer to Section 4.4.2.3.

Siskiyou County

Siskiyou County is currently in process of updating its 1973 General Plan. The 1973 General Plan does not contain objectives and policies specific to water quality and hydrology. However, it does contain objectives and policies to address the need to preserve unique and important aquatic habitats, as well as for the direct and indirect benefits to the citizens of Shasta County. (Siskiyou County 1973). Refer to Section 4.4.2.3.

4.5.3 Impacts and Mitigation Measures

Additional information on environmental impacts on hydrology and water quality can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*, pages 127 through 155.

Impact WATER-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

The Proposed Project is not expected to violate Basin Plan water quality objectives for fecal coliform and *E. coli; c*oncentrations of bio-stimulatory substances, nutrients, chlorophyll-*a,* and phytoplankton; drinking water uses and aquatic life protection; water color; dissolved oxygen concentrations; oil and fuels; pesticides; radioactive materials; taste and odor; water temperature; and toxic contamination. A discussion of Proposed Project-affected waters in relation to pH, erosion and sedimentation, total suspended solids, turbidity, and water temperature is provided below.

4.5.3.1 pH

The McCloud River watershed upstream of the Proposed Project area lies on volcanic formations with few calcareous deposits that would serve to buffer natural pH variations. As a result of these inflow conditions and low levels of algal photosynthesis in McCloud Reservoir, daytime sampling (profiles) in McCloud Reservoir documented pH levels that mostly were within the Basin Plan criteria of 6.5 to 8.5. In some instances, pH values up to 8.9 were observed in the upper layer of the reservoir in 2007; however, pH was typically between 6.5 and 8.5 during the 2007 and 2008 sampling. These exceedances are part of the existing environmental condition. PG&E will obtain agency-required permits for the construction of new recreation facilities, as required by local, California, and/or federal regulations, on a project-by-project basis. For projects that would disturb one or more acres of soil, PG&E will obtain coverage under the Construction General Permit from the RWQCB (or the SWB, if applicable) for stormwater discharges associated with construction activity and will prepare a SWPPP. All conditions and requirements of the SWPPP or other permits, including measures to prevent runoff from concrete activities, would be included with construction specifications implemented as part of each project to minimize impacts. Operation of new flow measures as part of the Proposed Project would not be expected to have any impact on pH within the Proposed Project reservoirs or Proposed Project-affected stream reaches. Therefore, the Proposed Project operations, maintenance, and construction activities, would have a less than significant impacts related to pH levels.

Impact: Less Than Significant

Mitigation Measures: None required.

4.5.3.2 Toxicity

Ammonia levels measured for the Proposed Project were well below toxicity thresholds. A limited amount of rainbow trout tissue sampling for mercury was conducted in the Pit and McCloud Rivers, which found mercury concentrations of approximately 0.05 milligram per kilogram (mg/kg), which is well below the 0.3 mg/kg USEPA criteria. Measurements were taken in summer 2007 at the sediment-water interface of McCloud and Iron Canyon reservoirs to assess oxidation-reduction potential (i.e., a measure of anoxia sometimes used to indicate conditions suitable for mercury methylation); data were above the range typically associated with methylation. No mining activities occur within 1 mile of the Proposed Project boundaries, limiting potential sources and input of metals to the Proposed Project-affected portion of the system. No other toxic materials (e.g., pesticides) were identified as potential issues. In 2024 the Pit River (from the confluence of North and South Forks to Shasta Lake) was included on the 303(d) list for toxicity.

The toxicity tests included survival of zooplankton, phytoplankton, and a minnow. Zero of eight sediment samples tested with *Hyalella azteca* exhibited significant toxicity. All toxicity samples were collected more than 50 miles upstream of the Proposed Project and it is not expected that the Proposed Project contributes to toxicity in the Pit River.

PG&E will obtain agency-required permits for the construction of new recreation facilities, as required by local, California, and/or federal regulations, on a project-by-project basis. For projects that would disturb one or more acres of soil, PG&E will obtain coverage under the Construction General Permit from the RWQCB (or the SWB, if applicable) for stormwater discharges associated with construction activity and will prepare a SWPPP. All conditions and requirements of the SWPPP or other permits, including measures to prevent toxic construction materials from entering waterways, would be included with construction specifications implemented as part of each project. New flow measures implemented under the Proposed Project operations are not expected cause any change to toxicity in Proposed Project reservoirs or Proposed Project-affected stream reaches. Therefore, Proposed Project operations, maintenance, and construction would have a less than significant impact related to toxicity levels.

Impact: Less Than Significant

Mitigation Measures: None required.

4.5.3.3 Sediment

The Basin Plan requires that the suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. The Proposed Project operations and specific maintenance activities at proposed facilities may release suspended sediment to downstream waters. Unpaved roadways and spoil piles may act as sources of sediment during periods of high runoff. Construction of the Proposed Project's recreational facilities and maintenance activities for roads and structures could result in the removal of vegetation and disturbance of surface and subsurface soils. During relicensing studies, local erosion sources were noted just below Iron Canyon Dam that contribute fine sediment to Iron Canyon Creek. In addition, the SWB 401 certification conditions and USFS 4(e) conditions specify gravel harvest from McCloud Reservoir and augmentation in the McCloud River downstream of McCloud Dam that could affect suspended sediment in the reservoir or river. Potential resuspension of sediment deposits in McCloud Reservoir is discussed in Section 4.5.3.6 Turbidity.

The Proposed Project includes implementation of the Erosion and Sediment Control Management Plan (USFS Final Section 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management), which requires PG&E to inventory, record, treat, and monitor Proposed Project-related erosion and sedimentation impacts to the Proposed Project and affected USFS lands and waters. The Erosion and Sediment Control Management Plan will: (a) describe the methods, protocols, and schedule to update the existing baseline erosion survey, and conduct subsequent periodic inventory and monitoring of Proposed Project-related erosion and sedimentation sites; (b) prioritize treatment sites and schedules based on a risk rating and hazard analysis process; (c) require development of site-specific treatment measures; (d) provide emergency erosion control protocols; and (e) include temporary measures to control site-specific erosion and sedimentation impacts during construction or improvement of Proposed Project facilities (including recreation facilities) or heavy maintenance of proposed facilities. These components are consistent with PG&E's Measure 12, as cited in Exhibit E of the Application for New License and FERC's final EIS (2011), with USFS 4(e) Condition 22 and SWB Final 401 Certification Condition 5, Erosion and Sediment Management. Results of treatment and monitoring will be submitted to

USFS on an annual basis and reviewed at the Annual Consultation Meeting. Final reports, if required, would be filed with FERC.

In addition, as part of the Proposed Project PG&E will implement applicable USFS Region 5 and PG&E BMPs during Proposed Project operation and maintenance activities, as well as improvements to or construction of new facilities to minimize the potential for impacts to water quality through erosion and sedimentation or contamination of water from the use fuels or other chemicals. Such BMPs may include, but are not limited to:

- Preserve existing vegetation where required and when feasible.
- Apply temporary erosion controls to remaining active and non-active areas as required by the California Stormwater BMPs Handbook – Construction and the contract documents. Reapply as necessary to maintain effectiveness.
- Implement temporary erosion control measures at regular intervals throughout the defined rainy season to achieve and maintain the disturbed soil area requirements. Implement erosion control prior to the defined rainy season.
- Implement spill prevention, control, and countermeasures.
- Stabilize non-active areas as soon as feasible after the cessation of construction activities.
- Control erosion in concentrated flow paths by applying erosion control blankets, erosion control seeding, and lining swales, as required in the contract documents.
- Apply seed to areas deemed substantially complete during the defined rainy season.
- At completion of construction, apply permanent erosion control to all remaining disturbed soil areas.

When finalized, the Project Implementation Guide will contain a complete list of current BMPs (USFS 2010b). The identified Environmental Components are sufficient to ensure that the Proposed Project would result in less than significant impacts.

Documentation of BMPs and an evaluation of their effectiveness would be done through monitoring and associated reporting, as required in the Proposed Project resource management plans.

PG&E will also obtain agency-required permits for the construction of new recreation facilities, as required by local, California, and/or federal regulations, on a project-by-project basis. For projects that would disturb one or more acres of soil, PG&E will obtain coverage under the Construction General Permit from the RWQCB (or the SWB, if applicable) for stormwater discharges associated with construction activity and will prepare a SWPPP. All conditions and requirements of the SWPPP or other permits, including measures to prevent erosion and sedimentation, will be included with construction specifications and implemented as part of each project. Such permits may include, but are not limited to:

- A Construction General Permit from the RWQCB (or the SWB, if applicable) for stormwater discharges associated with construction activity. This applies to all construction projects that would disturb one or more acres of soil.
- Requires filing a Notice of Intent as well as preparation and implementation of a SWPPP.
- CWA permits for impacts to Waters of the United States/State from the USACE and the SWB.
- Lake or Streambed Alteration Agreement from CDFW for impacts within the bed and bank of the Proposed Project-affected waters.

All conditions and requirements of the permits will be included with construction specifications and implemented as part of the Proposed Project.

The Proposed Project includes Environmental Components to ensure that activities such as gravel augmentation, large woody material placement, and recreation facility construction would not cause significant suspended sediment increases. In relation to gravel harvest and augmentation, PG&E may need to obtain a Section 404 permit from the USACE.

With the implementation of the Proposed Project, including the Environmental Components listed above, there would not be a significant impact with respect to sediment. However, sediment related to natural inflows to McCloud Reservoir from Mud Creek is discussed below in the Settable Material, Suspended Material, and Turbidity sections. The primary discussion is provided in Section 4.5.3.6 Turbidity.

Impact: Less Than Significant

Mitigation Measures: None required.

4.5.3.4 Settleable Material

The Basin Plan criteria for settleable material specify that waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. An accumulation of sediment, which originates upstream of the Proposed Project area from Mud Creek, or natural sediment transport in the McCloud River (e.g., gravels), is an ongoing source of sediment to McCloud Reservoir. Mud Creek, a tributary upstresam of McCloud Reservoir, periodically delivers large amounts of fine volcanic sediment, from the Konwakiton glacier on Mount Shasta, directly into McCloud Reservoir. Mud Creek sediment is diverted through a ditch into Huckleberry Creek and enters the reservoir from Huckleberry Creek. Coarser materials are deposited in a delta in the reservoir downstream of the mouth of Huckleberry Creek and finer sediment can settle in distal portions of the reservoir. Visual observations as well as profile data indicated that a significant portion of the suspended material had settled out of the water column upstream of the MCR5 sampling station near the top of the reservoir (PG&E 2009b). Reservoir levels can influence the settling and resuspension of the sediment. McCloud Reservoir, with an original capacity of 35,234 acre-ft, has accumulated approximately 4,134,500 m^3 (3,352 acre-ft) of sediment over the 43-year period between 1964 and 2007, reducing the original capacity by approximately 10 percent and resulting in an average annual sedimentation rate of 96,150 cubic meters per year (m^3y^{-1}) (PG&E 2009). It is possible that climate change may be accelerating debris flows from Mud Creek, as increased melting of Konwakiton glacier results in a higher rate of sediment delivery.

Within the reservoir, the sediment forms a large delta in the McCloud River arm of the McCloud Reservoir. Approximately 82% of the accumulated sediment is fine sediment (<2 mm). At some point in the future, when the dam fills substantially with sediment, there will be an issue with the settled sediment such that the fine sediment will require removal, sequestration, or release downstream. Release downstream can have large-scale effects on aquatic resources (e.g., Klamath River dam removals). This would be a significant impact. With implementation of MM WATER-1: Long-term Fine Turbidity Control the impact would be less than significant. The accumulation of sediment in McCloud Reservoir has both positive and negative implications for habitat quality in the Lower McCloud River. Trapping of sand and finer sediment originating from Mud Creek within McCloud Reservoir can have a beneficial effect on aquatic habitat quality in the Lower McCloud River downstream of the dam through the reduction in suspended particles and fine sediment deposition. Conversely, McCloud Reservoir also interrupts gravel transport into the Lower McCloud River, which contributes to a reduction in spawning gravel quality and

quantity downstream of McCloud Dam. Refer to Section 3.4, Biological Resources, for a discussion of the Proposed Project's effects on fish and their habitat. With the implementation of the USFS 4(e) Coarse Sediment Management Plan and SWB 401 Certification, coarse sediment potentially will be removed from McCloud Reservoir and placed downstream. This will assist in improving habitat conditions for aquatic resources downstream of McCloud Dam. The Erosion and Sediment Control Management Plan will also help prevent settleable sediment from entering the waterways (e.g., roadways, Proposed Project-related erosion areas).

Mitigation Measure WATER-1 would be implemented to provide an approach for monitoring/managing sediment in the Project reservoirs. With implementation of the measures, the Proposed Project near-term effect related to settleable material would be less than significant. The long-term effect of fine sediment accumulating in McCloud Reservoir or Iron Gate Reservoir and potentially being released downstream would be significant. However, with implementation of MM WATER-1, which would (1) monitor fine sediment accumulation in Proposed Project reservoirs and (2) develop an actionable plan to manage the sediment to avoid future release of accumulated fine sediment into downstream reaches, the impact would be less than significant.

Impact: Less Than Significant With Mitigation

Mitigation Measures: MM Water-1: Long-term Turbidity Control

4.5.3.5 Suspended Material

The Basin Plan suspended material objective states that waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses. Natural suspended material originating from Mud Creek adversely affects water clarity in the Lower McCloud River by periodically delivering large amounts of fine volcanic sediment from the Konwakiton Glacier on Mt. Shasta into McCloud Reservoir (via a diversion ditch to Huckleberry Creek). These large, episodic debris flow events predate the Proposed Project and are unrelated to proposed operations. Synoptic data collected during non-runoff and non-mass-wasting-event periods indicate that suspended material levels are generally low in all Proposed Project waters. Suspended material, however, is directly related to the settleable material issues discussed above and the turbidity issues discussed below. The same factors that potentially affect settleable material and turbidity would affect suspended sediment (refer to those sections). With the implementation of the mitigation measures identified in settleable materials and turbidity sections, the potential adverse impacts related to suspended material at the Proposed Project Reservoirs will be less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

4.5.3.6 Turbidity

The Basin Plan turbidity objective is that waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is less than 1 NTU, controllable factors shall not cause downstream turbidity to exceed 2.

- Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

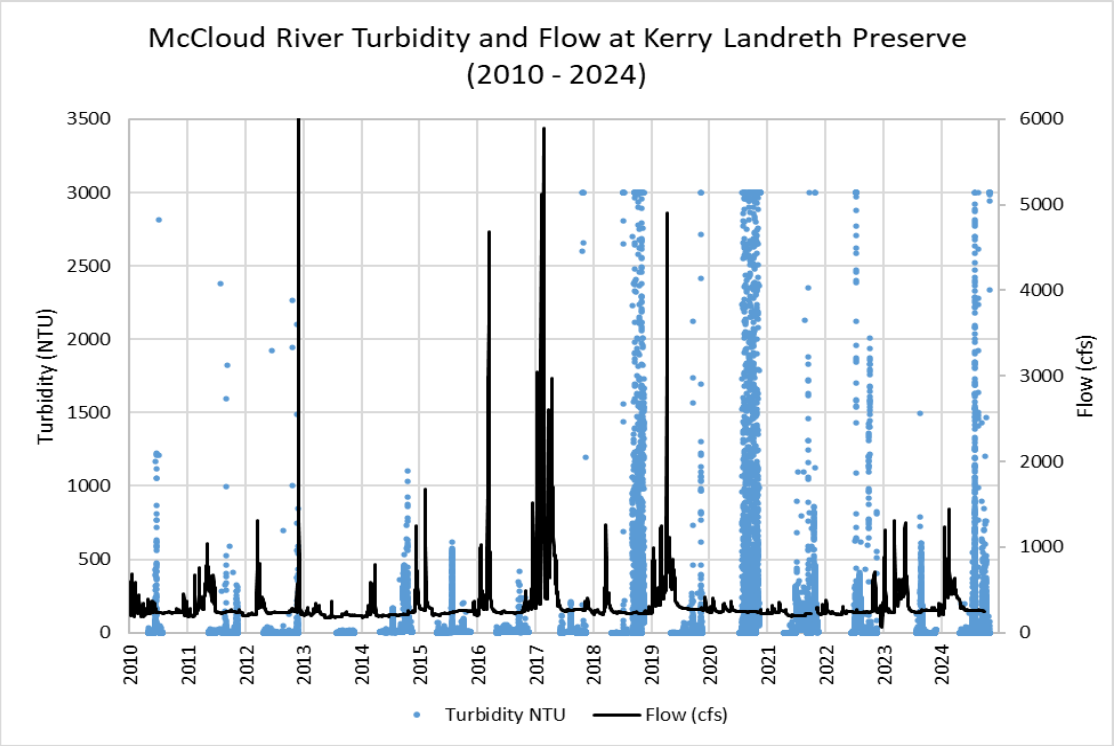
In determining compliance with the above limits, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected.

Proposed Project operations and routine reservoir drawdown and maintenance may adversely affect turbidity in the McCloud River. Periods of reservoir drawdown occurring in 2007 and 2008 were not accompanied by increased turbidity below McCloud Dam. However, subsequent monitoring of turbidity in the river has identified periods of resuspension of sediment in McCloud Dam and subsequent increased turbidity downstream (McMillen & McBain 2024). Testing of the lower-level valve at Iron Canyon Reservoir did cause a temporary increase in turbidity in Iron Canyon Creek, but turbidity returned to baseline conditions within one day; therefore, such tests are unlikely to adversely significantly affect beneficial uses.

Turbidity originating from natural episodic Mud Creek events can cause spikes in turbidity in McCloud Reservoir, which can transfer into Lower McCloud River. Continuous turbidity monitoring over five events in August-October 2007 and August-September 2008 showed downstream turbidity levels in the Lower McCloud River ranging from 65 to 300 NTU below McCloud reservoir, 12 to 155 NTU above Claiborne Creek, and 5 to 72 NTU above Shasta Lake. Depending on the size of the Mud Creek wasting event, the post-event “cleansing” period can last anywhere from a few days to more than a week. Turbidity levels typically spike on the day the event pulse reaches the dam outlet and then decline significantly over the next several days (typically four to eight days).

Figure 4-6 shows long-term monitoring of turbidity in the Lower McCloud River 1.6 miles downstream of Ah-Di-Na and near Shasta Lake. Significant high turbidity events are typical each year and frequently occur during the warmer, low-flow season. Sediment trapping within McCloud Reservoir decreases the total sediment load reaching the Lower McCloud River (Nevares and Sagraves 2009); however, turbidity in the Lower McCloud River appears to be higher with the reservoir in place than under natural conditions without the reservoir. For example, Nevares and Sagraves (2009) Figure 61 shows the turbidity in Mud Creek (Mud-G) and turbidity below McCloud Reservoir but does not show the combined inflow turbidity of the turbid Mud Creek (Mud-G) and the clear water McCloud River inflow on a flow weighted basis. Between July and October 2008, Mud Creek flows ranged from approximately 3 to 17 cfs, with an average of about 11 cfs (Nevares and Sagraves 2009 Figure 49).

During the same period, the flow in the McCloud River averaged 664 cfs (CDEC MSS gage). Based on the observed flow and turbidity data, the combined flow weighted inflow turbidity estimate into McCloud Reservoir is lower than the observed turbidity below McCloud Dam. For example, turbidity in Mud Creek of 100 NTU would result in a mixed inflow turbidity of approximately 2.8 NTU (assuming 1 NTU in the McCloud River upstream) and would be lower than the observed outflow turbidity below the dam. Figure 4-7 shows the flow weighted inflow turbidity into McCloud Reservoir and the observed outflow turbidity in the McCloud River below McCloud Dam. The outflow turbidity not only peaks higher than the inflow turbidity but also maintains a higher average over time.



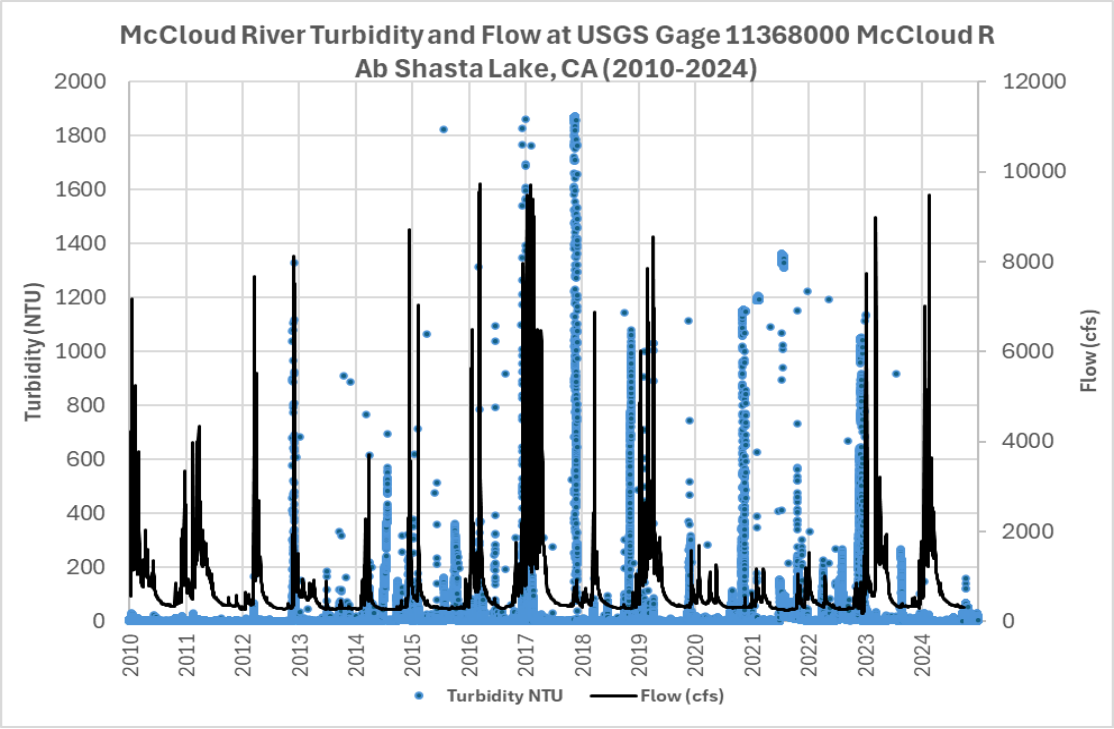


Figure 4-6. Historical McCloud River turbidity and flow at Kerry Landreth Preserve, 1.6 miles downstream of Ah-Di-Na (top) and USGS 11367800 – McCloud R A Ah-Di-Na NR McCloud CA and USGS Gage 11368000 McCloud Ri Ab Shasta Lake, CA (bottom) (2010-2024)

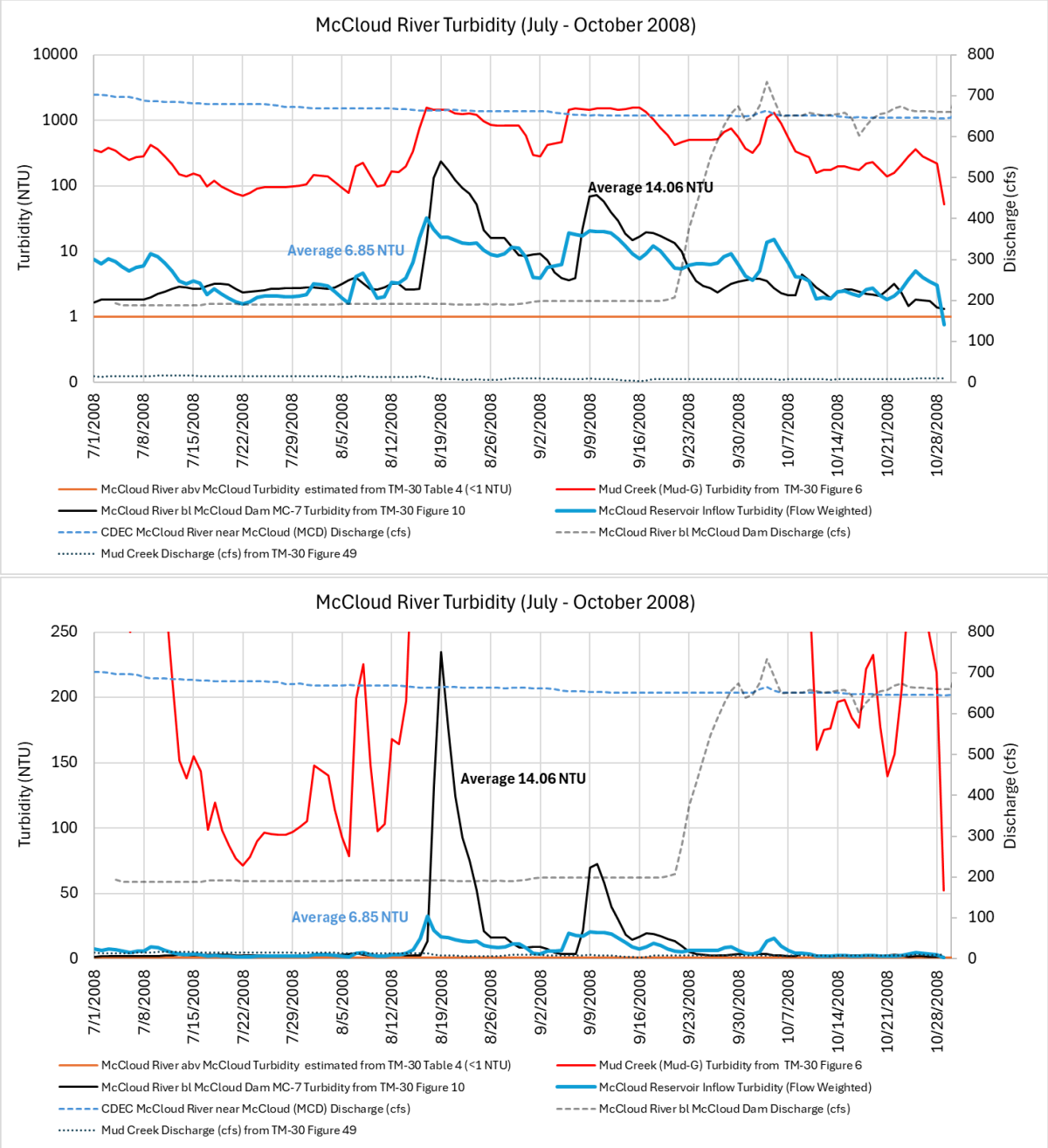


Figure 4-7. Calculated inflow turbidity and measured outflow turbidity below McCloud Dam based on Nevares and Sargraves 2009 Figures 6, 10, and 49 and CDEC and USGS flow data (July 1 – Sep 2008) logarithmic scale (top) and linear scale (bottom). On average inflow turbidity is less than outflow turbidity (6.85 versus 14.06 NTU) and has lower peaks than the outflow turbidity.

Without additional turbidity and flow data that include the combined turbidity inflow to McCloud Reservoir and the turbidity outflow below McCloud Dam it is not possible to determine the extent the current Hydroelectric Project is increasing turbidity releases above the Basin Plan standard and it is not possible to determine the overall effect of the Proposed Project on turbidity. Data collected in 2008 show that the

existing Hydroelectric Project exceeds the Basin Plan standard. The Proposed Project minimum flows in the summer are similar or slightly higher than the existing Hydroelectric Project (215 cfs versus 200 cfs Normal Year or 160 cfs Dry Year) and could result in similar, higher, or lower turbidity, in different portions of the Proposed Project area. Higher flows from the Proposed Project may slightly decrease turbidity through dilution but it is unknown how releases from the lower portion of the reservoir and the suspended sediment density current in the reservoir would behave under higher flow releases. It is possible that the Proposed Project will exceed the Basin Plan standard. Also, analysis of historical data indicates that fluctuating reservoir levels likely result in the resuspension and mobilization of previously deposited fine sediment in McCloud Reservoir and causes high turbidity in the McCloud River below McCloud Dam (McMillen & McBain 2024). The Proposed Project has a potentially significant impact on the Basin Plan turbidity objective in the Lower McCloud River.

A mitigation measure is needed to address this issue. MM Water-2 includes a McCloud Reservoir and McCloud River monitoring plan that (1) accurately monitors inflow turbidity from Mud Creek and the McCloud River and other inflow sources as appropriate (e.g., Huckleberry Creek), (2) accurately monitors inflow flow rate for the primary inflow sources, (3) monitors reservoir profiles of turbidity and temperature, (4) monitors outflow turbidity and flow from all discharges, (5) develops a numerical model of the reservoir, (6) determines the effect of the reservoir on outflow turbidity related to the Basin Plan standard and management actions, if needed, to address turbidity issues.

In the Iron Canyon watershed, turbidity levels of the inter-basin transfer from the McCloud River watershed during Mud Creek events were slightly above those found during base flow conditions. Continuous monitoring at Iron Canyon Dam measured maximum daily average turbidity during two August-September 2008 Mud Creek events of 5.5 NTU, represented a change of 4.2 NTU above pre-event levels. Under base flow conditions in the Pit River watershed, turbidity ranges were 0.8 to 2.1 NTU (3 to 6 milligrams per liter TSS) upstream of James B. Black Powerhouse, 1.5 to 4.1 NTU (2 to 3 milligrams per liter TSS) below Pit 6 Powerhouse, and 1.1 to 6.8 NTU (2 to 5 milligrams per liter TSS) below Pit 7 Powerhouse. These baseline turbidity data indicate that conditions in the Pit River upstream of the James B. Black Powerhouse (above the inter-basin transfer) were similar to those measured downstream of the Pit 5 Powerhouse (downstream of all diversion inputs) during non-event periods.

During periods when mass-wasting is occurring on Mount Shasta, a signal of Mud Creek turbidity reaching the Iron Canyon Creek sites was apparent, with turbidity increases of up to 4 NTU above pre-event levels. However, the large volume of flow coming from the Pit 3, 4, and 5 Hydroelectric Project, as well as settling that occurs in Pit 6 and Pit 7 reservoirs, attenuated potential effects of turbidity in the Pit River system. Only one of the two major turbidity events occurring in 2008 was measured by the continuous recording sensor in the Lower Pit River; the maximum turbidity at this site during the August 2008 Mud Creek event was measured as 2.6 NTU, about 1 NTU above pre-event levels. The increases in suspended sediment concentrations and turbidity in Iron Canyon Creek and the Pit River, resulting from inter-basin transfer between the McCloud River basin and the Iron Canyon Creek and Pit River basins during episodic mass-wasting events, caused minimal, temporary exceedances of basin plan criteria (<4.5 NTU) and would not deleteriously affect fish populations in Pit 6 Reservoir or downstream impoundments.

The Proposed Project includes Environmental Components to ensure that activities such as gravel augmentation, large woody material placement, and recreation facility construction would not cause significant turbidity increases. In relation to gravel harvest and augmentation, PG&E may need to obtain a Section 404 permit from the USACE.

At some point in the future, when McCloud Reservoir fills substantially with fine sediment, there will be a potential issue with the settled sediment such that the fine sediment will require removal, sequestration,

or release downstream. Release downstream would have large-scale effects on turbidity (e.g., Klamath River dam removals). This would be a significant impact if it occurs. With implementation of MM WATER-1: Long-term Turbidity Control, which includes monitoring and planning to avoid this impact, the impact would be less than significant.

Construction-related activities are discussed in the Sediment section above. These activities would require implementation of the Erosion and Sediment Control Management Plan, BMPs, and adherence to agency-required permits for the construction of new recreation facilities that would protect water from construction-related turbidity increases.

With the implementation of the measures above, including MM WATER-1 Long-term Turbidity Control and MM Water-2 McCloud Reservoir and McCloud River turbidity monitoring, modeling, and management actions, potential adverse impacts related to turbidity from the Proposed Project could be less than significant.

Impact: Less Than Significant with Mitigation

Mitigation Measures: MM Water-1: Long-term Turbidity Control; MM WATER-2: Turbidity Measures and Monitoring.

4.5.3.7 Water Temperature

Additional information regarding environmental impacts on water temperature can be found in FERC's final EIS (FERC 2011), Section 3.3.2.2, *Environmental Effects*, pages 111 through 114.

The Basin Plan requires that at no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. The Proposed Project could potentially affect water temperature in McCloud Reservoir, the Lower McCloud River, Iron Canyon Reservoir, Iron Canyon Creek, Pit 6 and Pit 7 reservoirs, and the Pit River due to changes in reservoir operations and minimum flow releases, and other releases.

McCloud Reservoir and Iron Canyon Reservoir are relatively large reservoirs that support coldwater conditions for trout, typically less than 20°C. Temperatures in McCloud Reservoir reflect the large volume of cool water entering the reservoir from the spring-fed Upper McCloud River and the relatively short residence time of water in the reservoir. Daily average surface water temperatures at upstream reservoir stations in McCloud Reservoir ranged from 6.9°C in May to 16ºC in August. Water temperatures in Iron Canyon Reservoir are influenced by water delivered from the McCloud Reservoir hypolimnion and some surface water warming. The water temperatures and water quality conditions in the reservoir include a well-developed thermocline and a deep thermally stable hypolimnion, despite a short residence time, which supports a coldwater trout fishery. The temperature of the flows from the bottom of Iron Canyon Dam are similar to the temperature of the McCloud River upstream of McCloud reservoir. Proposed Project operational changes, which include slightly increased minimum flow releases from the reservoirs (see below), are not expected to affect the existing cold water conditions in the reservoirs.

It is possible that increased minimum flows in the Proposed Project due to the USFS 4(e) minimum instream flow condition and SWB 401 Certification Condition 10 Whitewater Recreation, could modify water temperature in the river reaches.

Iron Canyon Creek Proposed Project minimum summer instream flows increase from 3 cfs to 7 to 10 cfs, depending on the water year type. The increased minimum flow in Iron Canyon Creek would reduce the amount of warming downstream resulting in cooler water temperatures. Near the bottom of Iron Creek

(Station ICC3) water temperature in the summer would remain cold and water temperature would decrease approximately 0.5 - 1°C depending on the water year type relative to current conditions. Water temperature in the Pit River would generally not be affected, however, because the overall flow into the Pit River would be similar under the No Project and Proposed Project conditions (and the change in minimum flows in Iron Creek would be small compared to the much larger powerhouse inflows to the Pit River).

An example of the existing water temperature from 2010 to 2024 in the Lower McCloud River is shown in Figure 4-7. Proposed Project minimum flows in the Lower McCloud River during the summer (August) increase from 160 cfs in dry years and 200 cfs in normal years to 215 cfs in all water years at MC-1 gage at Ah-Di-Na campground. Based on a flow and water temperature analysis using modeling data available from PG&E (2009b), this would result in slightly cooler water temperatures downstream. For example, Figure 4-28 shows the effects of different magnitude flow releases on water temperature along the length of the Lower McCloud River.

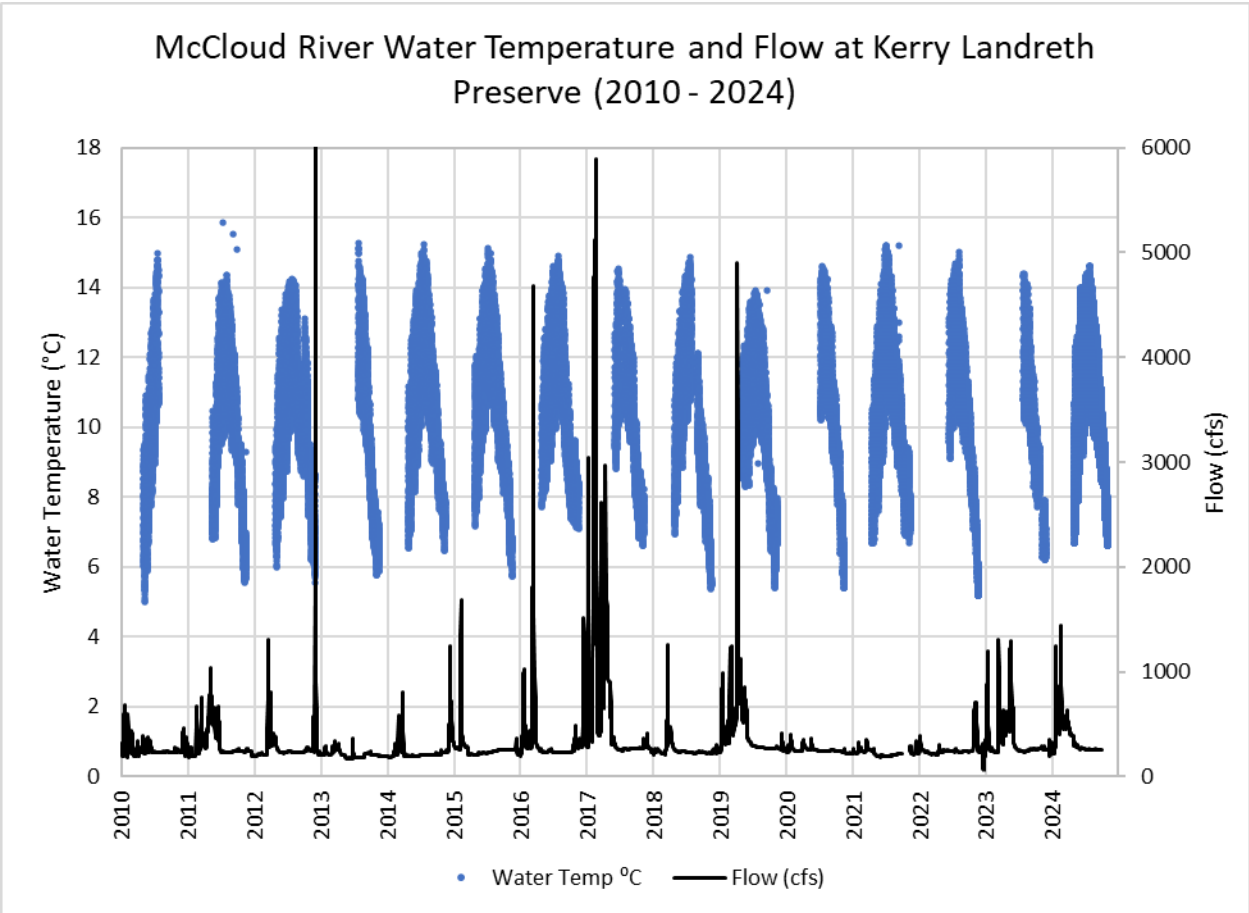


Figure 4-8. Historical McCloud River water temperature (Kerry Landreth Preserve, 1.6 miles downstream of Ah-Di-Na) and flow (USGS 11367800 – McCloud R A Ah-Di-Na NR McCloud CA) (2010-2024)

Flow releases of 150 cfs result in a water temperature of 12°C at RM 16.5 and releases of 300 cfs result in a water temperature of 12°C at approximately RM 13. This is 0.02 miles more 12°C cold water per cfs, which would increase the length of August cold water habitat 1.5 miles in dry years and 0.35 miles in normal years. During September, Proposed Project minimum flows decrease to 200 cfs and the No

Project minimum flows in dry and normal years are 180 cfs or 210 cfs, respectively. The Proposed Project effect on water temperature is small (Figure 4-4). During other times of the year such as spring when the minimum flow releases are higher or whitewater boating flows may occur, Proposed Project flows would not have an effect on water temperature. Overall, the Proposed Project operations would have a less than significant impact on water temperature compared to the Hydroelectric Project conditions.

Impact: Less Than Significant

Mitigation Measures: None required.

4.5.3.8 Summary

With implementation of Environmental Components of the Proposed Project including the Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management), SWPPS, applicable BMPs and management actions required by other agency permits, including SWB Final 401 Certification Conditions (see Appendix C), impacts related to water quality would be less than significant with the exception of accumulation of fine sediment, that if released would significantly impact water quality. Current examples of reservoir obsolescence and subsequent release of fine sediment into downstream reaches with environmental consequences (dissolved oxygen, suspended sediment, turbidity) include dams/reservoirs such as those on the Klamath River that have been breached. With implementation of MM WATER-1: Long-term Turbidity Control the potential impact would be less than significant. Turbidity effects of McCloud Reservoir on the Lower McCloud River are potentially significant, potentially elevating turbidity above Basin Plan standards. Additional data collection, analysis, and modeling are required to understand and mitigate this effect if necessary. This increase can result from routine operations, reservoir drawdowns, and resuspension of previously settled sediments. Mitigation Measure MM WATER-2: McCloud Reservoir and Lower McCloud River Turbidity Monitoring and Modeling would be required to determine the impact of the Proposed Project and reduce it to be less than significant.

Mitigation Measure WATER-1: Long-term Turbidity Control. PG&E shall incorporate the following measures into the proposed Erosion and Sediment Control Management Plan:

- Within the first full calendar year following license acceptance and every five years thereafter throughout the term of the license, PG&E shall monitor sediment accumulation in McCloud and Iron Canyon reservoirs, including the total amount of sediment accumulated and the percentage of reservoir volume.
- PG&E shall include within the Erosion and Sediment Control Management Plan specific actions to manage the sediment in the reservoirs to avoid a future release of excess sediment into the rivers downstream (e.g., sequestration, removal, periodic release). The plan shall account for the potential effects of climate change on sediment inputs to the reservoirs. The plan shall be developed in cooperation with CDFW, SWB, and USFS.

Mitigation Measure WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling. To prevent Proposed Project operations from increasing turbidity levels in the McCloud River below McCloud Dam, PG&E shall incorporate the following measures in the proposed Erosion and Sediment Control Management Plan:

- Continuously monitor inflow turbidity from Mud Creek and the McCloud River upstream of the Mud Creek inflow, and other McCloud Reservoir inflow sources as appropriate (e.g., Huckleberry Creek);

- Continuously monitor discharge of the primary turbidity inflow sources;
- Monitor McCloud Reservoir profiles of turbidity and temperature monthly April – November or more frequently if needed to characterize turbidity conditions within the reservoir;
- Continuously monitor outflow turbidity and discharge from McCloud reservoir;
- Develop a numerical model of the reservoir temperature and turbidity that can be used to assist management of reservoir turbidity outflows; and
- Determine the effect of the reservoir and Proposed Project operations on outflow turbidity related to the Basin Plan standard and identify management actions, if needed, to mitigate and address turbidity issues. Implement the management action, as appropriate.

Impact WATER-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

For the purposes of this element, a project's impacts to groundwater would be considered substantial, and thus significant, if the project prevented implementation of a groundwater management plan, including by disrupting planned groundwater recharge projects, or if the project would use more than five percent of the annual yield of a groundwater basin and would result in lowering groundwater levels in a manner that renders existing groundwater wells inoperable.

Groundwater contributes approximately 30 percent, or 2.7 million acre-feet (ac-ft), of the total water supply for the SR region (DWR 2015). The Proposed Project area is located within the Shasta–Pit Planning Area of the SR Hydrologic Region. Based on 2010 data, water users in the Shasta–Pit Planning Area uses three percent of the total average annual groundwater supply of the SR Hydrologic Region. Of this amount, 12 percent (11.3 total ac-ft) is used for urban uses (DWR 2015), which includes uses from the Hydroelectric Project. Currently, the Hydroelectric Project uses two wells for potable water at Deadlun and Hawkins Campground and other PG&E facilities along the Pit River. The extraction of groundwater would be necessary to provide a water supply for some of the proposed recreational facilities. Up to seven new wells would need to be installed at the following locations:

- Tarantula Gulch Inlet
- Tarantula Gulch Boat Launch
- Star City Campground or its alternate
- Red Banks Day Use
- Gap Creek Campground
- Iron Canyon Dam Boat Launch and Day Use Area
- Fenders Flat Day Use

Similar to the two existing wells, all the new wells would be topped with a handicap accessible hand pump, except for one (at Iron Canyon Dam Boat Launch and Day Use Area), as electricity is not available at this location. However, the new wells would be designed and used for seasonal transient uses such as hose bibs for drinking water and rinsing; other facilities such as flush toilets, sinks, and showers would not

be provided. Based on water usage estimates from the USFS, camping and day use facilities without flush toilets and showers require approximately six gallons per day (gpd) during the peak of the recreation season, which is generally two months (SWRCB 2019). If all the new wells are installed and assuming peak usage occurs for the entire five-month recreation season, the Proposed Project would require approximately 6,300 gallons (or 0.02 ac-ft) annually. This increase in use of groundwater would be less than 0.18 percent of the total groundwater supply used for potable water in the Shasta–Pit Planning Area. Therefore, the Proposed Project would not substantially deplete groundwater supplies. Further, the Proposed Project is not anticipated to significant change groundwater recharge because there is minimal change in reservoir storage and streamflow levels. Potential adverse impacts from the Proposed Project on groundwater would be less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact WATER-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial on- or off-site erosion or siltation

For the purposes of this element, alteration of existing drainage patterns resulting in erosion or siltation associated with a Proposed Project would be considered substantial, and thus significant, if it would damage any existing structures or violate waste discharge requirements.

The Proposed Project does not propose any changes to the course of any of the rivers or tributary streams within the Proposed Project area relative to existing conditions. It is possible that off-stream erosion or siltation may occur as a result of the construction of new recreational facilities. The Proposed Project includes requirements that the applicant provide for appropriate management of these sites as part of the Erosion and Sediment Control Management Plan and any required Proposed Project-specific permits. PG&E would also obtain agency-required permits for the construction of new recreation facilities, as required by local, state, or federal regulations, on a project-by-project basis. For projects that would disturb one or more acres of soil, PG&E would obtain coverage under the Construction General Permit from the RWQCB (or the SWB, if applicable) for stormwater discharges associated with construction activity and would prepare a SWPPP. Conditions and requirements of the SWPPP or other permits, including measures to stormwater runoff and erosion / siltation would be included with construction specifications implemented as part of each project. The Proposed Project also includes the addition of recreational facilities, which may slightly increase the number of impervious surfaces, but this minor change would not affect any existing streams or rivers. Also refer to the discussion under “ii” below.

As part of the Proposed Project, there would be gravel harvested from McCloud Reservoir and gravel augmentation in the McCloud River downstream of McCloud Dam. PG&E would be responsible for obtaining a Streambed Alteration Agreement from the CDFW; and a Section 404 permit from the USACE, as applicable. These permits would cover all management activities included in the USFS Coarse Sediment Management Plan and be protective of on- and off-site erosion or siltation. In addition, increases in instream flow and whitewater boating flows in the Lower McCloud River and instream flows in Iron Canyon Creek would occur with the Proposed Project implementation. The specific changes in instream flows below McCloud Reservoir Dam are described in Chapter 2, Project Description, Tables 2-4 and 2-5. The increases in flows would be minor relative to channel-forming flows under existing conditions. For the Lower McCloud River, the average estimates of bed mobility thresholds range from 1,130 cfs to 2,060 cfs (Nevares and Stallman 2009). The maximum Proposed Project instream flows

would be 575 cfs in Wet years at the Ah-Di-Na stream gage (Gage MC-1), which are below the estimates of bed mobility thresholds. Therefore, it is unlikely that the new instream flows would substantially change sediment transport or channel morphology in the Lower McCloud River. No changes to the Pit River flows are proposed or would occur.

With the Environmental Components identified above, the impacts of the Proposed Project on altering the existing drainage pattern of the Proposed Project area related to on- or off-site erosion or siltation will be less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site

For the purposes of this element, a project would have a significant impact if it increased the amount of surface runoff from project sites in a manner that caused flooding where flooding did not previously occur or that increased existing typical flood levels in a manner that exceeded the capacity of flood management facilities.

The Proposed Project includes the construction of recreational facilities, which would increase the amount of impervious conditions relative to existing conditions. The proposed improvements are in relatively remote areas surrounded by undeveloped forested land. No significant areas of connected impervious surfaces would be created. The construction of bathroom facilities (i.e., small structures with impervious roofs), information kiosks, and minor amounts of paving would result in a slight decrease in infiltration of water into the subsurface and an incremental increase in surface water runoff in these Proposed Project areas. However, the changes in infiltration and runoff would be negligible relative to the amounts of infiltration and runoff within the larger Proposed Project area and watersheds of the McCloud and Pit Rivers and their tributaries. The Proposed Project would not be expected to cause increases in the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; therefore, the impact would be less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

The existing and proposed facilities within the Proposed Project area are not served by an existing public or private stormwater system. It is possible, however, that polluted runoff could result from construction of new recreational facilities if, for example, hazardous materials (e.g., fuel) were spilled. The Proposed Project includes requirements that the applicant provide for appropriate management of these sites as part of the Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management) and by obtaining any required Proposed Project-specific permits for the construction of new recreation facilities, as required by local, California, or federal regulations, on a project-by-project basis. For projects that would disturb one or more acres of soil, PG&E would obtain coverage under the Construction General Permit from the RWQCB (or the SWB, if applicable), which would require monitoring and prevention measures to avoid water pollution, including a

SWPPP to prevent stormwater runoff. With implementation of these measures, the Proposed Project would have a less than significant impact.

Impact: Less Than Significant

Mitigation Measures: None required.

iv. Impede or redirect flood flows?

For the purposes of this element, the impact of a project that results in redirection of flood flows would be considered significant if the project resulted in a permanent expansion of the flood plain in a manner that required redrawing of flood hazard maps, or if on a seasonal basis the project would result in the backing up or redirection of flood flows in a manner that damages existing residences or other structures.

Proposed recreational improvements include small structures (e.g., bathrooms, boat ramps, information kiosks, etc.), some of which may be located near rivers or streams. However, the structures are small and isolated (i.e., separated by undeveloped land), and rivers and streams in the Proposed Project area are typically steep gradient and highly confined, resulting in a minimal floodplain hazard designation. Environmental Components such as gravel augmentation and large woody material placement are also not anticipated to impede or redirect flood flows. Therefore, the Proposed Project would have a less than significant impact.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact WATER-4: In flood hazard, tsunami, or seiche zones, risk of release of pollutants due to project inundation?

The Proposed Project area is not located in a designated flood hazard, tsunami, or seiche zone. Accordingly, the Proposed Project will not have an impact related to the release of pollutants in a flood hazard, tsunami, or seiche zone. Further, rivers and streams in the Proposed Project area are typically steep gradient and highly confined, resulting in a minimal floodplain hazard designation.

Seismic shaking during earthquakes can result in the formation of waves within open bodies of water. The two major types of seismically generated waves are tsunamis and seiches. Tsunamis are waves generated by the displacement of a large volume of water. Therefore, tsunamis only occur in large water bodies such as oceans, bays, or large lakes. Displacement of water can occur by several mechanisms (including subaqueous land-sliding or explosions), but is most commonly caused by submarine displacements of the earth's crust resulting from earthquakes. The McCloud and Iron Canyon Reservoirs are not large enough to allow the development of tsunamis.

A seiche is a wave that oscillates in lakes, bays, or gulfs. Seiches range from a few minutes to a few hours as a result of seismic or atmospheric disturbances. Small seiches are almost always present on larger lakes, and the frequency of the oscillation is determined by the size of the water body, its depth and contours, and the water temperature. Larger seiches can be caused by nearby or distant earthquakes and occur when the seismic wave signature is resonant with the natural period of the water body, which is controlled by its shape and depth. If local or more distant earthquakes were to occur, a seiche could occur within the reservoir. The magnitude of a seiche would depend on the amplitude and period of seismic waves affecting the reservoirs. Given the size and natural period of these water bodies (refer to

Chapter 2), it is expected that if a seiche occurred, it would be small in height. For these reasons, there would be no potential for a release of pollutants resulting from flooding, tsunami, or seiche in the Proposed Project area and there would be no impact.

Impact: No Impact

Mitigation Measures: None required.

Impact WATER-5: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

As discussed under "Impact 4.4-1" above, in accordance with USFS and SWB conditions, PG&E will finalize and implement the Erosion and Sediment Control Management Plan, which requires PG&E to inventory, record, treat, and monitor Proposed Project-related erosion and sedimentation impacts to waters of the state and affected USFS lands. PG&E will implement applicable BMPs during Proposed Project operation and maintenance activities, as well as improvements to or construction of new facilities, to minimize the potential for impacts to water quality through erosion and sedimentation or contamination of water from the use of fuels or other chemicals. With the implementation of the Erosion and Sediment Control Management Plan, including specified BMPs, the Proposed Project will comply with the Basin Plan water quality objectives.

As discussed under "Impact 4.4-2" above, if all the proposed wells are installed and assuming peak usage occurs for the entire five-month recreation season, the Proposed Project would require approximately 6,300 gallons (or 0.02 ac-ft) annually. This minor increase in use of groundwater would be less than 0.18 percent of the total groundwater supply used for potable water in the Shasta–Pit Planning Area. Further, there is no sustainable groundwater management plan applicable to the Proposed Project area. Therefore, the Proposed Project would not conflict with or obstruct the implementation of a water quality control plan or sustainable groundwater management plan. The impact would be less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

4.6 TRIBAL CULTURAL RESOURCES

As noted in the Introduction (Section 1), on December 6, 2019, the WWT and NCRA jointly filed a Petition for Reconsideration of the IS/ND, CEQA Findings, and certification (see Appendix A). The petition states that the SWB violated the Public Trust Doctrine because the conditions do not adequately protect public trust resources including the beneficial uses of salmon and steelhead spawning habitat; cold freshwater habitat on the McCloud River; warm freshwater habitat of the Pit River; spiritual, cultural, and traditional resources of the WWT; and public recreational uses. On the same day, PG&E filed a petition for reconsideration of the certification that requested corrections and asserted that the Board lacked authority to impose some of the conditions included in the certification.

After receiving the two petitions for reconsideration the State Water Boad's Executive Director issued an interim order directing staff to reinitiate CEQA consultation with the California Native American Tribes (Tribes) affiliated with the geographic area of the project to inform whether additional CEQA work was needed. The SWB notified affiliated Tribes of the new opportunity to consult pursuant to AB 52 on January 6, 2021. The WWT requested consultation. In March 2022, the SWB issued a Notice of Preparation and Scoping Meetings for a SEIR for the McCloud-Pit Project (March 2022 NOP).

This section includes an environmental and cultural setting, regulatory context, summary of AB 52 consultation and TCR identification and evaluation, impact analysis, and mitigation measures. Proposed Project components relevant to tribal cultural resources (TCRs) are included in this analysis, including: (a) operations, maintenance, and construction components proposed by PG&E in its license application; and (b) minimum instream flows and management plans required by the USFS 4(e) Conditions. Refer to Chapter 1 for additional information on the Proposed Project. This analysis evaluates the potential for impacts to TCRs from the Proposed Project; Project Alternatives are discussed in Chapter 5. For previous analysis of Project effects and impacts for cultural and Tribal resources within the Project area see FERC's final EIS (FERC 2011) and the SWB's PG&E McCloud-Pit Hydroelectric Project Water Quality Certification Final IS/ND (SWB 2019).

The consultation meetings between the SWB and the WWT (see Section 4.6.3 for details) have resulted in documentation and evaluation of the WWT Traditional Cultural Landscape TCR within and surrounding the Proposed Project and centered on the McCloud River, as set forth in the *Winnemem Wintu Tribe Traditional Cultural Landscape Tribal Cultural Resource Memorandum and Analysis In Support of California Register of Historical Resources Evaluation McCloud-Pit River Hydroelectric Project Relicensing (FERC PROJECT No. 2106)* (WWT, Davis King and West 2025: Appendix E) (WWT TCR Memo). Information from the memorandum is summarized in this section for context for the impacts analysis and proposed mitigation measures.

4.6.1 Environmental and Cultural Setting

This section describes the existing environmental and cultural setting as it relates to the TCR analysis. Information set forth in Appendix E and summarized in this section has been obtained through ongoing consultation with the WWT and information provided by the WWT and consultants who have been working with the WWT for decades, using historical documentation prepared over the past 150 years. The WWT TCR Memo documents the WWT's sacred connection to the McCloud River watershed, Mount Shasta (*Buliyum Puyuuk*), and related cultural, spiritual, and ecological relations and includes historical context, ethnographic information, legal and regulatory background, and a detailed evaluation of the landscape's eligibility and significance as a TCR.

4.6.1.1 The Winnemem Wintu Tribe and the McCloud River Watershed

The WWT has occupied, interacted with, cared for, and relied upon a vast landscape within and surrounding the McCloud River Watershed (the WWT Traditional Cultural Landscape) since time immemorial. The WWT Traditional Cultural Landscape originates at Mount Shasta and includes the entire McCloud River watershed, Yét Atwam Creek (formerly Squaw Valley Creek), Squaw Creek, and portions of Lake Shasta and the upper Sacramento River watershed with contributing features of the natural world interwoven with archaeological sites, spiritual places, gathering locales, and other landscape features, along with the cosmos.

In the words of the WWT (excerpt from the WWT TCR Memo):

> From the beginning, we Winnemem were given the responsibility to protect our sacred places, our sacred mountains and springs which give us strength and knowledge, feed our rivers, streams, land, ceremonial sites and burial grounds where our ancestors rest, the sanctuaries for sacred plants, landscapes that hold spiritual powers, sources of wisdom and especially *Buliyum Puyuuk* the great mountain now called Mount Shasta. The land and all its parts are central to the Winnemem people and the spirit and the whole area of the Winnemem territory is part of our religion.

> The name Winnemem Wintu means "people of the middle river" or "people of the middle water." The "middle river" is the McCloud River, which lies between the Sacramento and Pit rivers south of Mount Shasta in Siskiyou and Shasta counties. The Winnemem Wintu are of the river, they belong to it, are part of it, and the river is an extension of who Winnemem are physically, culturally, and spiritually. This is core to understanding Winnemem cosmology and identity, a complex weaving of land, water, air, and life that form the Winnemem ancestral landscape.

Within the WWT Traditional Cultural Landscape there are more than 600 known, named, and mapped important places that are contributing elements of the Landscape. These contributing elements include habitation places, battle locations, gathering areas, places of ceremony, trails, spiritual locales including sacred springs and caves, and other significant areas.

The WWT have been severely affected by colonization, genocide, and forced modification of lifeways throughout the 1800s and into the 1900s. Forty-two WWT were massacred along the McCloud River during the genocides in the 1880s. The WWT was displaced from their ancestral lands in the 1940s with the construction of Shasta Dam and Shasta Lake reservoir in 1945 which inundated 90 percent of traditional WWT land and a portion of the WWT Traditional Cultural Landscape. The Central Valley Project Indian Lands Acquisition Act (55 Stat. 612) authorized the removal of the WWT so the reservoir could be filled, but the provisions of that act for just compensation were never fulfilled. Many ancestral villages, cemeteries, and sacred sites were inundated and lost. Some families retained allotments, but others gained newly acquired allotments, which then became focal points of WWT activities. Several ceremonies (Dekkas, Children's Rock, Puberty Ceremony) take place at former allotment lands. Despite existing impacts and intrusions on the WWT Traditional Cultural Landscape and traditional use of the watershed, the WWT have continued to be active participants in the McCloud River watershed ecosystem and their spiritual homeland.

Defining characteristics and contributing elements of the WWT Traditional Cultural Landscape and significance to the WWT are described in Section 4.6.3.

4.6.1.2 Existing Impairments of the McCloud River Watershed Ecosystem

The construction of Shasta Dam created a barrier to fish passage that prevented winter-run Chinook salmon from returning to spawning runs on the McCloud River. Construction of the McCloud Dam in 1965 further impacted the WWT, culturally significant aquatic species such as winter-run Chinook salmon (*Nur*), other salmon runs, McCloud River redband trout (*Oncorhynchus mykiss stonei)*, steelhead (*Oncorhynchus mykiss iridius)*, hardheads (*Mylopharodon conocephalus*), Pacific lamprey (*Entosphenus tridentatus)*, Big Beaver (*Besus*), southern torrent salamander (*Rhyacotriton variegatus*), and the overall health of the McCloud River watershed ecosystem. Under existing conditions, operation of the existing Project:

- Is a barrier for salmon and other aquatic species traveling upriver from Shasta Dam.
- Impedes the natural movement of sediments and large woody material from creating salmon spawning habitats, gravel beds, and other benefits for the ecosystem downstream of McCloud Dam.
- Results in the build-up of fine sediment that can be resuspended, mobilized, and released into the Lower McCloud River in concentrations that result in higher turbidity than would exist under typical natural conditions.

- Must comply with flow requirements ranging from 160-210 cubic feet per second (cfs) in normal years and 160-180 cfs in dry years and has altered the natural hydrograph of the McCloud River such that the mean volume of flows at Ah-Di-Na throughout the year ranged from 204-484 cfs from 1974-2006. More specifically, existing requirements for flows at Ah-Di-Na are:
- January 1-February 28: 160 cfs for normal and wet year.
- March 1 - April 30: 170 cfs for normal and wet year.
- May 1- May 15: 170 cfs for a normal year and 160 cfs for a dry year.
- May 16-August 31: 200 cfs for a normal year and 160 cfs for a dry year.
- September 1 – December 15: 210 for a normal year and 180 cfs for a dry year.
- December 15-December 31: 170 cfs for normal and wet years.
- Has altered the natural hydrograph of the McCloud River such that daily average summer water temperatures in the upper reaches of the Lower McCloud River are approximately 10°C (suitable to support summer spawning of winter-run Chinook salmon) but warm to approximately 16°C (above the 13°C standard for spawning/incubation) as the river approaches Shasta Lake.
- Involves ongoing routine operation and maintenance activities that can affect the qualities and integrity of sites and places the WWT use for cultural, subsistence, ceremonial, or spiritual activities such as include snow removal, grading of dirt and gravel roads, repair of asphalt roads, vegetation clearing, hazard tree removal, slide debris removal, herbicide spraying, trail maintenance, pest management, managing signs, performing minor maintenance and repairs, operating water systems, including water treatment and testing, and dumpster waste removal.

See Section 4.4 Biological Resources and the 2019 IS/ND for additional detail.

In addition, seasonal recreational uses of the McCloud River watershed can affect aesthetic qualities of sites the WWT use for cultural, ceremonial, or spiritual purposes and can result in members of the general public being present at ceremonial sites during times when the WWT is conducting ceremonies.

4.6.1.3 Salmonid Reintroduction

The return of winter-run Chinook salmon (*Nur*), to the McCloud River for the first time since Shasta Dam blocked their migration in the 1940s was a response to repeated years of severe drought. In 2014, NFMS adopted a final recovery plan for the SR winter-run Chinook salmon and CV spring-run Chinook salmon that explained that establishing populations above impassable barriers such as Shasta Dam would aid recovery of the species. “Urgent Drought Actions” developed by NOAA in 2022-2023 (NMFS 2023a) led to the proposal and adoption of an ESA 10(j) and 4(d) Final Rule designating a NEP of SR winter-run and CV spring-run Chinook salmon (Federal Register 88 FR 58511, 08/28/2023). The designation prohibits take of SR winter-run and CV spring-run Chinook salmon in the NEP area, with exceptions for take by authorized personnel acting in compliance with 50 CFR 223.203(b), take incidental to lawful activities including but not limited to recreation, water management, and power production, and take pursuant to a permit issued by NMFS under section 10 of the ESA.

In the summer of 2022, the WWT joined federal and state agencies to bring winter-run Chinook salmon eggs back to the McCloud River, where the fish once spawned in cold mountain water that kept their eggs

alive through the hot summer months. Under the authority of ESA §10(a)(1)(A), amended permit 16477-3A, the U.S. Fish and Wildlife Service (USFWS) delivered fertilized eggs to the McCloud River Ah-Di-Nah Campground from the USFWS Livingston Stone National Fish Hatchery near Redding, California. Eggs were delivered in two batches of 20,000—the first by truck and the second by helicopter. With assistance from the WWT, the first batch of hatchery eggs was placed in streamside remote site incubators (RSI) (NMFS 2022). A few days after the eggs were reintroduced, starting approximately July 16, 2022, turbidity in the McCloud River rose to extreme levels (turbidity peaked at 266.7 NTU). To reduce impacts, the surviving fertilized eggs were transferred to streamside heath trays (incubators) to reduce sedimentation. After incubation and rearing, the developed fry were released into the McCloud River and 1,600 juveniles were collected at RSTs set near McCloud Bridge 20 miles downstream from the egg incubation site. These fish were then transported to the SR downstream of the Keswick Dam to continue their migration to the Pacific Ocean (NMFS 2023b).

Independent of the Urgent Drought Actions, in February 2022, the DWR received $1.5 million in funding for the JSCS Pilot Project in the upper McCloud Arm of Shasta Lake. The goal of the JSCS project is to test a system that would improve fish passage around high-head dams through the efficient collection and downstream passage for juvenile fish migrating out to the ocean. The design and evaluation team is led by the DWR in partnership with NOAA Fisheries, CDFW, the WWT, and others (DWR 2022).

In 2023, CDFW and NMFS came together with the WWT in a formal “Agreement and Co-Stewardship Framework” agreement that integrates WWT traditional knowledge and cultural tribal values with CDFW’s and NMFS’ recovery responsibilities and research and management practices toward the goal of restoring traditional cultural fisheries including winter-run Chinook (*Nur*) affected by lack of access to habitats in the “Cultural Landscape of the Winnemem Wintu Tribe along the McCloud River Watershed” (Appendix E, Attachment 3). On July 12 and July 26 - 2023, 25,528 and 28,224 eggs, respectively, were transported by helicopter from the Livingston Stone National Fish Hatchery to the Ah-Di-Nah campground. For the eggs in the care of the WWT, Chief Sisk, working with University of California at Davis, incorporated traditional knowledge to develop the “Nur Nature-based Incubation System.” The system functions by placing eggs in incubation chambers that resemble the natural riverine system. This method provides the salmon the freedom to swim after hatching and the ability to choose when to enter the McCloud River (ICO 2024). At the end of the season, the CDFW captured and transported 7,775 juveniles from the McCloud River to the Lower SR. Researchers used two in-water trapping methods to collect juvenile salmonids in the Lower McCloud River.

In 2024, approximately 80,000 eggs were incubated in the McCloud River, and juveniles were captured and transported to the Lower SR. Similarly, the plan for 2025 was to continue winter-run Chinook salmon egg transfer (80,000 eggs), incubation, recapture, and transfer of juveniles to the SR. Adults will not be transferred to the McCloud River until water treatment/sanitation upgrades have been completed at Livingston Stone National Fish Hatchery. NMFS, USFWS, BOR, and CDFW are in conversation and pursuing these upgrades (Steve Edmondson, NMFS, Email 2/27/2025 to Craig Addley). The NMFS provided a letter to the SWB providing additional information on anadromous fish, cold freshwater habitat and cold-water spawning. Appendix 2 provided Flow and Habitat Recommendations NMFS Recommended Federal Power Act Section 10(j) Conditions (NMFS 2024b).

In 2025, CDFW confirmed reports of adult salmon near Ash Camp on the Lower McCloud River and saw an adult female Chinook salmon exhibiting spawning behavior along with small males (jacks) nearby. These fish would have originated from earlier egg rearing efforts on the river and subsequent rearing of the juveniles in Shasta Lake. This indicates that baseline conditions allow Chinook salmon to reach adulthood and spawn, though survival rates across the life cycle are not clear. CDFW staff has recommended further surveys of spawning habitat (CDFW Memo 8/8/2025).

The plan for 2026 is to continue winter-run Chinook salmon egg transfer (80,000 eggs), incubation, recapture, and transfer of juveniles to the SR. Adults will not be transferred to the McCloud River until water treatment/sanitation upgrades have been completed at Livingston Stone National Fish Hatchery. NMFS, USFWS, BOR, and CDFW are in conversation and pursuing these upgrades (Steve Edmondson, NMFS, Email 2/27/2025 to Craig Addley).

4.6.1.4 TCR Identification and Evaluation

This section summarizes the findings from identification and evaluation of significance of TCRs from the SWB's additional consultation with the WWT under AB 52 and in response to the WWT and NCRA Petition for Reconsideration (2021). This subsequent analysis pertains only to resources identified in consultation with the WWT and also accounts for inadvertent discoveries. The Pit River Tribe did not request consultation as part of the subsequent EIR and AB 52 consultation letter sent on January 6, 2021. For additional information on Pit River Tribal resources see PG&E's McCloud-Pit Relicensing TCP Report (Nevares and MacDougall 2009), Project 2106 HPMP, FERC's final EIS (FERC 2011) and Section 3.2.18 Tribal Resources of the SWB's PG&E McCloud-Pit Hydroelectric Project Water Quality Certification Final IS/ND (SWB 2019). In accordance with PRC section 21084.2, this analysis considers the potential for Proposed Project activities to cause a substantial adverse change/impact in the significance of a TCR.

4.6.1.5 AB 52 Consultation

The SWB sent an AB 52 Notification of *Consultation Opportunity for Tribal Cultural Resources Related to the McCloud-Pit Hydroelectric Project* letter to the WWT and Pit River Tribe on January 6, 2021. The WWT requested consultation. Appendix E provides a summary of AB 52 consultation between the SWB and the WWT that occurred from March 2021 through the present. This consultation resulted in the identification of the WWT Traditional Cultural Landscape TCR, which is documented and evaluated for the CRHR and summarized in this section. The consultation process provided substantial evidence that supports the SWB's determination, in its discretion as lead agency, that the WWT Traditional Cultural Landscape qualifies as a TCR as defined by PRC section 21074(a)(2). The following sections describe the WWT Traditional Cultural Landscape TCR and its historical significance. For the full evaluation see the WWT TCR Memo in Appendix E.

4.6.1.6 Area of Analysis

As discussed in Section 4.6.2, PG&E in consultation with FERC and SHPO established an APE for the Proposed Project as part of their NHPA Section 106 consultation process. The Area of Analysis (AOA) for the SEIR is the portion of the APE that applies to the Winnemem Traditional Cultural Landscape TCR identified through consultation and discussed in the following sections. The AOA includes the following: (1) a corridor 100 feet from either side of the banks of the McCloud River, downstream from McCloud Dam to the confluence with Yét Atwam Creek (formerly Squaw Valley Creek); (2) public land between the perimeter road around McCloud Reservoir and the water surface from Tarantula Gulch, crossing McCloud Dam, to Star City Creek; (3) lands on the west side of the McCloud River, upstream of Tarantula Gulch Boat Launch; and (4) lands affected by the potential construction of powerhouses at McCloud Dam, including a 200-foot buffer around the proposed powerhouse site at the base of McCloud Dam, a 200-foot corridor centered on the proposed McCloud Transmission Line route, and an area on the west side of the Pit River arm of Shasta Lake extending from the high-water mark upslope to a proposed access road.

The entire stretch of the McCloud River from below the McCloud Dam to the inlet of Shasta Lake is also included in this analysis to match other SEIR studies such as aquatics. See Figure 4-9.

4.6.1.7 Tribal Cultural Resources Evaluation and Significance

There are three formal ways to identify a resource (which may include a cultural landscape) as a TCR for purposes of CEQA (Pub. Resources Code, § 21074; also see Section 4.6.2.2). The first is if the resource is included or determined eligible for inclusion in the CRHR. The second is if the resource is included in a local register defined in subdivision (k) of Section 5020.1. And the third is if the lead agency determines that the resource is significant pursuant to at least one of the four criteria set forth in subdivision (c) of PRC section 5024.1, giving consideration to the significance of the resource to a California Native American Tribe (Pub. Resources Code, § 21074, subd. (a)(2)). This section documents the SWB's determination, pursuant to subdivision (a)(2) of PRC section 21074, that the WWT Traditional Cultural Landscape is a TCR as provided in subdivision (b): a cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape and meets Criteria 1, 2, and 4, and potentially meets Criterion 3 and is a TCR for purposes of CEQA. A summary of the evaluation is provided below, see Appendix E for a detailed evaluation and integrity analysis.

Additionally, the WWT has their own local register of cultural/ historical resources per PRC 21074 (a)(1)(B) Local Register of Historical Resources: *The Winnemem Wintu Register of Tribal Resources*. This list includes the WWT Traditional Cultural Landscape.

WWT Traditional Cultural Landscape Boundary and Description

The WWT Traditional Cultural Landscape (Landscape) is a large cultural landscape originating at Mount Shasta following the McCloud River Watershed to areas now submerged under Lake Shasta. It includes the entire McCloud River watershed, Yét Atwam Creek (formerly Squaw Valley Creek), and portions of Lake Shasta and the upper Sacramento River watershed (Figure 4-9). It contains hundreds of contributing features of the natural world interwoven with archaeological sites, spiritual places, gathering locales, and other landscape features, along with the cosmos centered around Mount Shasta and the McCloud River. Many of these features have been recognized individually by federal agencies over the years.

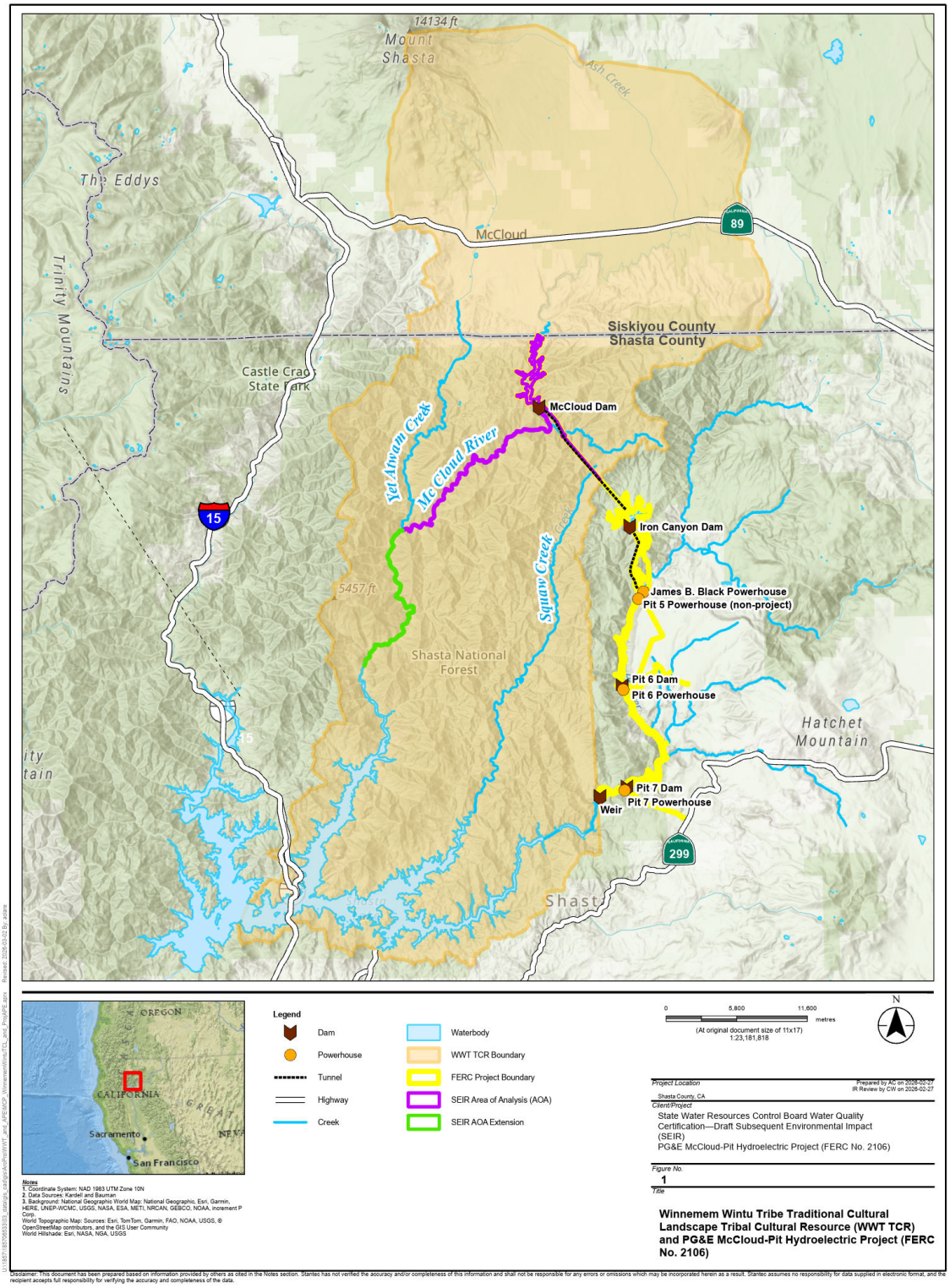


Figure 4-9. WWT Traditional Cultural Landscape TCR Boundary in relation to Project APE and SEIR AOA.

There are more than 600 known, named, and mapped important places encompassed within the Landscape boundary. These ancestral relationships are identified as contributing elements and character-defining features and together form the integrity and significance of the Landscape. These include habitation places, battle locations, gathering areas, places of ceremony, trails, spiritual locales including sacred springs and caves, and other significant areas. Of the 600 known places within the Landscape, 481 have been plotted in the Landscape boundary. Of these:

- 297 are place names with approximate mapped locations;
- 49 are place names specifically known and/or field verified;
- 25 are spiritual places with approximate mapped locations;
- 25 are spiritual places specifically known and/or field verified;
- 38 are habitation areas with approximate mapped locations;
- 26 are habitation areas with known locations;
- 15 are resource areas with approximate mapped locations; and
- 6 are resource areas that are specifically known and still accessible.

Of the 481 plotted locations, 27 are located within the AOA for the SEIR where they could be directly and indirectly impacted by the Proposed Project.

Character-Defining Features and Contributing Elements

The WWT Traditional Cultural Landscape's significance relates to the WWT ancestral homeland and their traditional lifeways. The period of significance is from the beginning of time for the WWT as a people and continues through to the present day as the Tribe maintains and continues their traditions and culture. The last two centuries have been notable for the WWT's struggle to freely practice their spirituality, live in their homeland, and preserve their culture. The WWT Traditional Cultural Landscape is intact and functioning. The WWT consider this landscape deeply sacred and essential for their survival—not just as a community, but, according to the WWT, for the wellbeing of the entire world.

Character-defining features and contributing elements for landscape TCRs include significant geographic features, places that provide materials or sustenance, design or construction features, interior spaces and features, aspects of the place in position to its physical and/or spiritual environment, and more. Some features are named places; others are categories of features likely to add to the landscape's eligibility. A summary of character-defining features of the WWT Traditional Cultural Landscape is provided here for context for the impact analysis. See Appendix E for an in-depth discussion.

Chinook Salmon (*Nur*)

The significance of the WWT Traditional Cultural Landscape is fundamentally associated with the role of salmon and its interrelationship with the WWT. The WWT have been caring for *Nur* since the beginning, ensuring that the fish return to their spawning grounds to lay their eggs and support the next generation of fish and people. In some cases, when fish met impassable barriers like waterfalls, Tribal members collected fish in baskets and transported them around the falls on foot so they could continue upstream to lay their eggs (NMFS 2023a, 2003b). This is one example of the Traditional Ecological Knowledge (TEK) the Winnemem use to manage and support salmon.

Nur is a character-defining feature of the WWT Traditional Cultural Landscape, in that if there is an impact on *Nur*, there is an effect on the WWT's relationship to that spiritual universe, and for the WWT there is no

distinction between the physical and spiritual world. Salmon is an emblematic species; healthy salmon means a healthy ecosystem, watershed, and people.

The presence of *Nur* in the landscape is vital, as their absence weakens both the WWT spiritual connection and the natural character of the river and its surroundings. As salmon travel 30,000 feet upriver on their journey from the ocean, they "bring rich nutrition to the animals and the trees" (Preston and Giraudie 2020). The overall structure and shape of the river change, and without the fisheries specifically, the Tribe's wellbeing and identity suffers, creating a potential loss of culture and traditions. *Nur* are intertwined with other character-defining features of the WWT Traditional Cultural Landscape. For example, spawning gravel beds are part of the Landscape and are much needed for *Nur* to continue. The glaciers of Mount Shasta and springs throughout the Landscape provide cold, clean water to the McCloud River watershed and forms deep pools along the River—an ideal environment for *Nur* to thrive. The springs and deep pools provide places where the WWT conduct salmon dances and ceremonies along the McCloud River. WWT dance, song, and prayer—key cultural, spiritual, and economic elements—are strengthened by reconnecting with McCloud salmon. "Salmon are sentient beings who carry their own wisdom, who are driven by a higher ecological purpose to sustain the river as well as the human and non-human relatives who live there" (Sisk and Dadigan 2024).

Reintroduction efforts have resulted in the return of *Nur* to the McCloud River. Two-year-old winter-run Chinook adult salmon were observed in the McCloud River in July 2025 (Candelaria 2025; CDFW 2025a); seven redds, a winter-run Chinook mature female, and two males (jacks) were observed shortly after (CDFW 2025b). These adults would have originated from earlier egg rearing efforts on the river and subsequent growth of juveniles in Shasta Lake.

Additional Character-Defining Features:

Additional character-defining features related to this impact analysis include the following, see Appendix E for the full list.

- **Waters:** such as McCloud River, salmon places, Springs and water sources, Sucker Pool in the Upper Fall, Sutti Sawel (pool used for healing), Yét Atwam Creek (formerly Squaw Creek), Waterfalls on the McCloud

- **Fish and Aquatic Species:** In addition to *Nur*, other aquatic character-defining features of the TCR include Big Beaver (*Besus*), which forms pools vital for *Nur*, and native species like, McCloud River redband trout (*Oncorhynchus mykiss stonei)*, steelhead (*Oncorhynchus mykiss iridius)*, hardheads (*Mylopharodon conocephalus*), Pacific lamprey (*Entosphenus tridentatus)*, Big Beaver (*Besus*), and southern torrent salamander are also critical to the health of the WWT Traditional Cultural Landscape TCR, the WWT people and the entire ecosystem

- **Wildlife and Plants:** such as culturally significant plants and fungi, habitat locations associated with important animal species, ethnobotanical teaching sites and gathering locales, especially at Ah-Di-Na

- **Ceremonies and Ceremonial Locations:** such as Coonrod, Dekkas, Puberty, Run4Salmon

- **Places:** such as Ah-Di-Na (plants, archaeology, and fishing), ancestral fishing locations, ancestral trails, ancestral villages, archaeological sites, bedrock milling places, doctoring places, important named landmarks, Mount Shasta

Significance to a California Native American Tribe

The WWT is a "California Native American Tribe" as defined in PRC 21073. Consideration of the significance of cultural landscapes to California Native American Tribes goes beyond the physical condition to include spiritual aliveness, ancestral consciousness, and ability to respond to prayer. The WWT Traditional Cultural Landscape TCR retains integrity of location, setting, material, workmanship, feeling and association. The overall McCloud River remains in the same place as it has always been, albeit impounded in a few areas to prevent flow, and the watershed is unchanged. The WWT actively uses their cultural landscape except where they are restricted by private property and inundation by reservoirs and have been stewarding and protecting their ancestral lands and relationships within the McCloud River watershed despite hundreds of years of intrusion and impact from Euroamerican settlers. The WWT Traditional Cultural Landscape is listed in the WWT's local register of cultural/historical resources per PRC 21074 (a)(1)(B) Local Register of Historical Resources.

Integrity means that those who value the place (the Winnemem) perceive a relationship between the place and the traditional activity that gives the place significance. Integrity for TCRs that are cultural landscapes goes beyond just the physical condition to include spiritual aliveness, ancestral consciousness, and ability to respond to prayer. In the context of considering the integrity and significance of a resource to a tribe it is inappropriate to interpose an external standard dismissing this relationship of a people to a place (such as archaeological values being used to judge traditional cultural significance). Integrity of condition refers to physical disturbances and alterations and how they may affect the ability of the place to continue to fulfill its cultural purpose (King 2003:174).

A summary of contributing elements and character-defining features that are important to maintaining the TCR's integrity are listed below. See Appendix E for details.

- **Location** – such as the McCloud River, ceremonial places and access to these places, *Nur* and other aquatic species habitat, fishing sites, sucker holes, diving holes, ancestral villages/ ethnographic places, trails, archaeological sites and bedrock milling places (including submerged archaeological sites in the reservoir), cemeteries, gathering locals and ethnobiological resources, springs and water sources and access to them.

- **Design** – such Ah-Di-Na (plants, archaeology, and fishing), sucker holes, ceremonial rocks, cultural plant gardens, villages, ceremonial places and placement of other features with respect to ancestral traditions, visibility of the stars or landscape features, and other purposeful placement.

- **Materials** – such as plants, water, McCloud River, *Nur*, sucker and diving holes and ceremonial rocks, natural terrain, or other elements that the Tribe has identified as integral to the place.

- **Feeling** – elements that evoke a sense of place for the community and a certain sense of traditional reminders or relationships. Some of these include the McCloud River, ceremonial places and the *Nur* salmon spirit.

- **Association** – such as WWT places, ceremonies, and WWT intergenerational involvement and association with each place within the TCL/TCR that is associated with their obligation to be responsible for and care for our relatives of today and of the past.

The introductory sentence in the TCR Memo (Appendix E) written by the WWT states, "Participation by the Winnemem Wintu in the process described [in this Memorandum] does not seek to validate our sacred relationship to Big Salmon (*Nur*) and the McCloud River, but rather to hold colonial agencies accountable for respecting our obligations to the land and the people." Federal and state agency

partnership with the WWT regarding recovery of salmon in the McCloud River watershed, however, supports and authenticates the WWT's position on the integration of salmon as a critical feature of their landscape and cultural identity.

As noted above, the construction of Shasta Dam made McCloud River winter-run Chinook salmon spawning runs unavailable to the fish. As part of their stewardship of the Landscape the WWT preserves the river's memory of the lost, sacred fish. WWT Dance Captain Rick Wilson observes that "We Winnemem are a salmon people, but because of the Shasta Dam, the salmon can't swim this river anymore, so we have to do it for them" (Dadigan 2011). As part of the Coonrod ceremony, WWT, substituting as salmon, dive into the McCloud Lower Falls, swim under the Middle Falls cascade, and then dive to the depths of the Upper Falls to get a stone which calls to them. This ceremony helps the WWT remember that in this ice-cold former spawning pool, *Nur* used to move the gravel around to lay their roe. This ceremony furthers the connection of WWT with salmon and helps give salmon a voice.

As stated by the WWT in the TCR Memo:

> From the beginning, we Winnemem were given the responsibility to protect our sacred places, our sacred mountains and springs which give us strength and knowledge, feed our rivers, streams, land, ceremonial sites and burial grounds where our ancestors rest, the sanctuaries for sacred plants, landscapes that hold spiritual powers, sources of wisdom and especially *Buliyum Puyuuk* the great mountain now called Mount Shasta. The land and all its parts are central to the Winnemem people and the spirit and the whole area of the Winnemem territory is part of our religion.
>
> Winnemem religion encompasses the entire Winnemem world. For us, it is the way you walk on the land, the way you treat your relatives… all of the relatives. The relatives include the spirits, the animals, the plants, the people, the Winnemem sacred spring, and *Buliyum Puyuuk*. Before there was a physical world, spirit beings roamed inside *Buliyum Puyuuk*. *Olelbes* (Creator) formed a physical world, and the spirits had to choose which physical figure each would become. Creator waited for them to choose a physical form. One spirit being became Eagle and flew off. Another chose Bear and walked away. And then one chose Salmon and swam to the ocean. Sunflower took root in the mountain meadow. All but one anxious spirit had chosen. Creator grew tired of waiting for the spirit to choose. Finally, the little being said: "I'm gonna be a human!" and ran down the mountain. Creator said "hmmm, that one's going to need a lot of help." So, he called back the water spirit, the fire spirit, and the mountain spirits and asked them all to take care of this little human, because he does not know his purpose. Big Salmon came back and gave the little human his voice so the human could communicate.
>
> This Creation legend occurs within the landscape we have mapped of the McCloud River watershed. We could not have a landscape without the place where it began. Each August, Winnemem return to Panther Meadow on the south side of Mount Shasta, the door to our "Genesis." This is where, since Creation, generations of Winnemem have held ceremony, and the people, the spring, and the Mountain itself are doctored with prayers and songs. All the places are connected spiritually, and our prayers go from the spring to the ocean. Our landscape is essential and critical to Winnemem life. Any restriction of access deprives our Tribe of a central principle on which the United States was established—that of religious freedom.
>
> Winnemem Wintu are a profoundly spiritual people, with deep, unbroken ancestral ties to the ancient homeland. The name Winnemem Wintu means "people of the middle river" or

> "people of the middle water." The "middle river" is the McCloud River, which lies between the Sacramento and Pit rivers south of Mount Shasta in Siskiyou and Shasta counties. The Winnemem Wintu are of the river, they belong to it, are part of it, and the river is an extension of who Winnemem are physically, culturally, and spiritually. This is core to understanding Winnemem cosmology and identity, a complex weaving of land, water, air, and life that form the Winnemem ancestral landscape.

Application of Criteria of Subdivision (c) of Public Resources Code Section 5024.1

A resource, including a cultural landscape that is geographically defined in terms of the size and scope of the landscape, is a TCRs for purposes of CEQA if the lead agency determines that the resource is significant because one or more Critieria apply to it. In applying the Criteria, the lead agency must consider the significance of the resource to a California Native American Tribe. (Pub. Resources Code, § 21074, subds. (a)(2) [citing Pub. Resources Code, § 5024.1, subd. (c)], (b).) The WWT Traditional Cultural Landscape retains integrity and is significant under Criteria 1, 2, and 4, and potentially significant under Criterion 3, and is therefore a TCR for purposes of CEQA. See Appendix E for additional details.

Criterion 1: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

The Landscape is significant under Criterion 1 for being associated with events that have made a significant contribution to the broad patterns of the WWT. There are multiple places within the landscape that are directly related to WWT history, traditional culture, and ongoing survival. Some of these places are related to Creation of the World, establishment of villages, epidemics of the 1830s, the Kaibai Creek Massacre, the recognition of WWT religion through the issuing of an AIRFA permit, occupation of the Toyon Wintu Center, Winyupus ceremony, Dekkas ceremony, the War Dance, and Run4Salmon Ceremony.

Criterion 2: Is associated with the lives of persons important in our past.

The Landscape is significant under Criterion 2 for being associated with significant personages in WWT history who are strongly connected with specific sites in the landscape. Similar to Criterion 1, the applicability of Criterion 2 to the Landscape can be broadly interpreted to include significant persons and, by extension, other beings of importance to WWT Creation legends and oral traditions, a majority of which occur within the landscape. Foremost among these is *Olelbes* (Creator), who brought forth the ancestors of the WWT at the headwaters of the McCloud River on Mount Shasta within another of the WWT's TCPs, Panther Meadow, determined eligible for the NRHP. This is where all resources and places of cultural and spiritual importance to the WWT were formed. *Nur* figures prominently in the origin stories and contemporary narratives of WWT origins. Other important people to the landscape are *Norelputis* (19th century leader of all Wintu in the Shasta area), the genealogical line of the WWT leaders—Dolikentilema (William Curl's father), William Curl (Florence Jones' father), *Chipoki* or Jenny Curl (Florence Jones' mother), E.D.C. Campbell, and Florence Jones. It is Florence Jones who educated current Chief Sisk. Other important figures within the TCR include *Besus* (Beaver), Wolf, Woodpecker, Hardheads, Hummingbird, Coyote, and more. The Old Man who lives atop *Buliyum Puyuuk* gave songs, the basket story, and more. Also, the Big Foot protectors of children came from within the landscape.

Criterion 3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The Landscape is potentially significant under Criterion 3, which recognizes resources that embody distinctive characteristics of a type, period, region, or method of construction, represent the work of a

master, or possess high artistic values. While traditionally Criterion 3 values tend to be associated with buildings and structures of the more modern era, they may also include gardens and similar stylistic places, along with rock art panels and village designs. The WWT has their own set of master crafts and traditions that, in part, define them, their values, beliefs and what they find beautiful, valuable, spiritually powerful, useful, or aesthetically pleasing. How some of these items were/ are made, or their purpose, may be culturally specific and have values that cannot be shared with those outside WWT culture. Criterion 3 values were not offered by the WWT for this study. A resource need only be eligible under one criterion, and there is sufficient data to evaluate the Landscape as a TCR eligible under Criteria 1, 2, and 4.

Criterion 4: Has yielded, or may be likely to yield, information important in prehistory or history.

The Landscape is significant under Criterion 4 as a resource that can yield, or has the potential to yield, information important to the past of a local area, California, or the nation. This criteria is most commonly used with respect to archaeological sites, however broader Landscapes can also yield important historical information and may be connected to the lifeways and history of a Tribal community. Portions of the WWT Traditional Cultural Landscape have already been documented and evaluated by various federal agencies on draft NRHP nomination forms as having data associated with individually eligible resources and contributing to the overall eligibility of the Landscape as a TCR. Information about time-honored ceremonies, places of power and spirit, and traditional cultural patterns have been communicated to numerous federal, state, and local agencies who have, for the most part, agreed that WWT resources and the landscape are intact and are important. Archaeological sites associated with the Landscape contribute to its overall significance and retain heritage and spiritual value to the people.

Additionally, there are relevant research questions related to WWT lifeways, which may provide important information to archaeologists—but also other earth-science disciplines such as fisheries, climate change, land use patterns, phenology, ecology, and a host of other scientific disciplines that crave historical data for their analyses. For example, the WWT knows that *Besus* (Beaver) created dams along the McCloud River, thereby enhancing fisheries and the overall health of the river. The WWT is knowledgeable about connections between salmon and the general health of the surrounding watershed ecosystem, and this knowledge on interconnectivity has data values for many disciplines—fisheries biologists, wildlife habitat specialists, botanical restoration, and more. Other areas of TEK and Tribal Knowledge can also contribute "data" about the interconnectivity of all things, knowledge about the environment, and information about WWT culture, history, and curated values.

4.6.2 Regulatory Setting

4.6.2.1 Federal

National Historic Preservation Act

PG&E's Hydroelectric Relicensing Project is considered an undertaking pursuant to 36 CFR § 800.16(y). The National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to take into account the effects of undertakings on historic properties and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on those undertakings. The ACHP's regulations implementing the procedures for section 106, located at 36 CFR Part 800, note that federal agency officials shall make a "reasonable and good faith effort" to identify historic properties by considering previous planning, studies, and research. An undertaking may have an adverse effect on historic properties when it directly or indirectly alters any of the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places (NRHP) through diminishing of integrity.

To determine whether an undertaking could affect NRHP-eligible properties including archaeological, ethnographical, and architectural properties, must be inventoried and evaluated for listing in the NRHP. NRHP analysis is based upon all pertinent cultural resources guidance and best practices including that of 36 CFR Part 800 and technical bulletins including National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation and National Register Bulletin 38, which has recently been revised as the TCP National Register Bulletin (NPS 2024). For a property to be considered for inclusion in the NRHP, it must normally be at least 50 years old and meet the criteria for evaluation set forth in 36 CFR Part 60.4, which relate to the historical significance of the resource. A resource must possess integrity in addition to historical significance, as determined by the aspects of location, design, setting, materials, workmanship, feeling, and association.

The NHPA section 106 regulations found at 36 CFR § 800.4(a)(4) outline identification of historic properties and emphasize that information from Indian tribes should be gathered to assist in identifying properties "which may be of religious and cultural significance to them and may be eligible" for the NRHP. For example, under Criterion A (resources associated with events that have made a significant contribution to the broad patterns of our history), this may include the developmental history of the Tribal group, back to its Creation and the oral history associated with it. Such places may also be clearly connected to certain cultural patterns that are part of ongoing Tribal values, cultural activities, pivotal historic events, community definition, and other history. The regulations recognize that an Indian tribe "may be reluctant to divulge specific information regarding the location, nature, and activities associated with such sites. The agency official should address concerns raised about confidentiality pursuant to § 800.11(c)." The regulations also emphasize that Tribes possess special expertise in assessing the eligibility of their own historic properties, that is, people from outside the Tribe may be incapable of assessing their religious and cultural significance.

Federal Energy Regulatory Commission (FERC)

FERC is responsible for the issuance of hydroelectric operating licenses in accordance with the FPA of 1920 (16 United States Code [USC] 79[a]-825[r]) for all non-federal hydroelectric projects. When issuing hydroelectric licenses, FERC must consider the recommendations of federal and state agencies exercising administration over relevant resources of the State in which the project is located and the recommendations of Indian tribes affected by the project (16 USC § 803).

FERC requirements specified in Title 18 Code of Federal Regulations (CFR) §5.6(d)(3)(xii) for Tribal Resources are as follows:

Tribal resources. A description of Indian tribes, Tribal lands, and interests that may be affected by the project. Components of this description include:

(A) Identification of information on resources specified in paragraphs (d)(2)(ii)-(xi) of this section to the extent that existing project construction and operation affecting those resources may impact tribal cultural or economic interests, e.g., impacts of project-induced soil erosion on Tribal cultural sites; and

(B) Identification of impacts on Indian tribes of existing project construction and operation that may affect Tribal interests not necessarily associated with resources specified in paragraphs (d)(3)(ii)-(xi) of this section, e.g., tribal fishing practices or agreements between the Indian tribe and other entities other than the potential applicant that have a connection to project construction and operation.

FERC Project 2106 Conditions: Historic Properties Management Plan (HPMP)

As described in Chapter 2, the Historic Properties Management Plan (HPMP) that PG&E filed on October 26, 2010, and that FERC and the California State Historic Preservation Officer (SHPO) executed on May 11, 2011, has been incorporated into the Proposed Project. The HPMP presented to the SWB for certification outlines continued adherence to federal and state laws and regulations and regular communication the WWT the Pit River Tribe, and agencies regarding the management of historic properties and Traditional Cultural Places[17] (TCPs) within the Project's APE. The Project APE is defined as the FERC Project Boundary plus the following:

- 100 ft from either side of the banks of the Lower McCloud River, downstream from McCloud Dam to the confluence of Squaw Valley Creek.
- Public land between the perimeter road around the McCloud Reservoir and the water surface from Tarantula Gulch, crossing McCloud Dam, to Star City Creek.
- The area between the perimeter road around Iron Canyon Reservoir and the water surface and the area contiguous with tunnel-spoil areas having a reasonable potential to contain archaeological materials based on topography and site conditions.
- Lands on the west side of the McCloud River, upstream of Tarantula Gulch Boat Launch.
- Lands associated with Fenders Flat at Pit 7 Afterbay.
- A 200-ft buffer around the proposed powerhouse site at the base of McCloud Dam.
- A 200-ft corridor centered on the proposed McCloud and Pit 7 Afterbay Transmission Line routes.
- A 200-ft buffer around the proposed Pit 7 Afterbay Powerhouse and substation on the west side of the Pit 7 Afterbay Dam weir.
- A 200-ft corridor centered on the proposed location of the access road between Forest Road 34N17 and the proposed Pit 7 Afterbay Powerhouse site.
- An area on the west side of the Pit River arm of Shasta Lake extending from the high-water mark upslope to the proposed access road corridor between Pit 7 Afterbay Dam and Forest Road.

One of the specific goals of the HPMP is to facilitate regular communication and coordination with Tribes. As stated in the HPMP, PG&E will request a Qualified Tribal Cultural Monitor to be present from the Pit River Tribe and WWT during archaeological surveys, site testing, data recovery, non-emergency construction, and maintenance activities requiring ground disturbance that would create a reasonable effect to historic properties, and during long-term historic properties monitoring. The HPMP also outlines the need for confidentiality and various protocols and procedures such as public and PG&E staff education on cultural resource protection, handling inadvertent discoveries, managing emergencies,

[17] National Register Bulletin 38 has recently been revised and now uses the term "Traditional Cultural *Places*," in keeping with contemporary Tribal usage and to be consistent with the National Register of Historic *Places* (NPS 2023; 2024:9). The revised bulletin, now known as the TCP NR Bulletin, notes that the revision has "no change from previous versions of the TCP Bulletin in the definition of a TCP or how one is identified, documented, and evaluated for inclusion in the National Register" (NPS 2023; 2024:3).

curating recovered cultural materials, conducting future research, patrolling the Project area, monitoring cultural resources, and ongoing consultation.

Other Section 4(e) Conditions Management Plans

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. The USFS filed 34 section 4(e) conditions for the McCloud-Pit Project on January 29, 2010, and one revised condition on March 1, 2010. Under the USFS Final Section 4(e) Conditions for the Proposed Project, dated November 29, 2010, PG&E is required to finalize and file with FERC for approval the 12 environmental management/monitoring plans described in Chapter 2 in addition to the HPMP which was filed on October 26, 2010.

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act of 1990 sets provisions for the inadvertent discovery and/or intentional removal of human remains and other cultural items from federal and tribal lands. It clarifies the ownership of human remains and sets forth a process for repatriation of human remains and associated funerary objects and sacred religious objects to the Native American groups claiming to be lineal descendants or culturally affiliated with the remains or objects. It requires any federally funded institution housing Native American remains or artifacts to compile an inventory of all cultural items within the museum or with its agency and to provide a summary to any Native American tribe claiming affiliation.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act (AIRFA) of 1978 was enacted to protect and preserve the traditional religious rights and cultural practices of Native Americans. These rights include, but are not limited to, access of sacred sites, freedom to worship through ceremonial and traditional rights and use, and possession of objects considered sacred. The act requires that federal agencies evaluate their actions and policies to determine if changes are needed to ensure that Native American religious rights and practices are not disrupted by agency practices. Such evaluations are made in consultation with native traditional religious leaders.

4.6.2.2 State

CEQA and Public Resources Code (PRC)

Identification of Tribal Cultural Resources Under CEQA

CEQA requires the lead agency to consider the effects of a project on historical resources and TCRs. PRC section 21074 defines “tribal cultural resource” (TCR) as follows:

> (a) “Tribal cultural resources” are either of the following:
>
> > (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
> >
> > > (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

(B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

(b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Subdivision (c) of Public Resources Code section 5024.1 applies to resources that meet any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

A resource must also possess integrity which is defined by the California Office of Historic Preservation as the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Like the NRHP, the seven aspects of integrity: Location, Design, Setting, Materials, Feeling, Workmanship, Association.

California Register of Historical Resources (PRC Section 5024.1)

PRC section 5024.1 also establishes the California Register of Historical Resources (CRHR). The register lists all California properties considered to be significant historical resources. The CRHR also includes all properties listed or determined eligible for listing in the NRHP, including properties evaluated and determined eligible under section 106. The CRHR regulations govern the nomination of resources to the CRHR (14 California Code of Regulations section 4850). The regulations set forth the criteria for eligibility as well as guidelines for assessing historical integrity and resources that have special considerations.

AB 52 Tribal Consultation (PRC Section 21080.3.1)

PRC section 21080.3.1 requires that lead agencies formally consult with recognized California Native American Tribes during the CEQA process to discuss potential impacts on TCRs. Prior to the release of a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report, the agency must initiate consultation with tribes that are traditionally and culturally affiliated with the geographic area of the proposed Project if: (1) the Tribe requested of the agency, in writing, to be informed through formal

notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and (2) the Tribe responds, in writing, within 30 days of receipt of the formal notification of a proposed project and requests consultation with the agency (PRC section 21080.3.1(b)). Consultation is concluded when the agency and Tribe(s) agree to measures to mitigate or avoid significant effects on a TCR, or if either party concludes that mutual agreement cannot be reached after a good faith and reasonable effort (PRC section 21080.3.2(b)).

Health and Safety Code 7050.5: Human Remains

Section 7050.5 of the California Health and Safety Code states that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the Site or any nearby area reasonably suspected to overlie adjacent remains until the county coroner has determined whether the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission (NAHC) within 24 hours of this identification.

Public Resources Code 5097.98: Notification Of Most Likely Descendant

PRC section 5097.98 states that the NAHC, upon receiving notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5, shall immediately notify the most likely descendant (MLD) of the deceased. With permission of the landowner or a designated representative, the MLD may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The MLD shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

4.6.2.3 Local

Shasta County

The September 2004 Shasta County General Plan contains a Heritage Resources Element that intends to, "….identify and protect sites and structures of architectural, historical, archaeological, or cultural significance" (Shasta County General Plan 2004:6.10.1). The 2004 General Plan Heritage Resource Element has a sole objective; the protection of significant and historic cultural resources. To accomplish this objective, Shasta County has adopted Policy HER-a, "Development projects in areas of known heritage shall be designed to minimize degradation to these resources. Where conflicts are unavoidable, mitigation measures which reduce such impacts shall be implemented. Possible mitigation measures may include clustering, buffer or non-disturbance zones, and building sitting requirements" (Shasta County General Plan 2004:6.10.4).

Siskiyou County

Siskiyou County is currently in process of updating its 1973 General Plan. The 1973 General Plan does not contain objectives and policies specific to Tribal and heritage resources. However, the "Conservation Plan" within this document contains a section for archaeology in addition to forested lands, wildlife, natural resources, watershed and water recharge lands (Siskiyou County 1973).

4.6.2.4 Summary of Previous Studies for FERC Relicensing and SWB IS/ND, CEQA Findings, and Certification:

In support of PG&E's relicensing efforts, studies were conducted to identify TCPs and culturally sensitive areas within PG&E's McCloud-Pit Hydroelectric Project (Proposed Project) APE (Nevares and MacDougall 2009). As part of PG&E's studies, the Pit River Tribe and WWT requested separate TCP

investigations from which two separate reports were to be prepared. In addition, both Tribes requested formal agreements outlining the conduct of the TCP studies. PG&E entered into a Memorandum of Understanding (MOU) with each Tribe, recognizing the sensitivity of the resources under study, and the historical and cultural events that have affected the Tribes. The Pit River Tribe TCP study was completed (Nevares and MacDougall 2009) and results were incorporated into the Project HPMP (PG&E 2010) discussed in Section 1.3.1. Due to an impasse between PG&E and the WWT related to confidentiality of the TCP report, the WWT TCP study was not completed, and additional TCR information could not be developed prior to the adoption of the IS/ND due to the strict deadlines associated with issuing Section 401 water quality certifications. The March 2022 NOP identified TCR analysis as the primary focus of this subsequent EIR.

4.6.3 Impacts and Mitigation Measures

In accordance with PRC section 21084.2, sections 15125 and 15126.2 of the CEQA Guidelines, and the CEQA baseline described in Section 1.3, this analysis evaluates changes to the conditions existing in baseline year 2024 to consider the potential for Proposed Project activities to cause a substantial adverse change in the significance of TCRs, including the WWT Traditional Cultural Landscape. For TCRs, the CEQA Guidelines' Appendix G Environmental Checklist generally inquires whether a project may cause a substantial adverse change in the significance of a TCR as defined in PRC 21704. To ensure all potential TCR impacts are covered, the analysis below augments the Appendix G checklist by separately addressing the Proposed Project's potential impacts the integrity and significance of the WWT Traditional Cultural Landscape TCR including character-defining features and contributing elements of the landscape (see Section 1.4.3 and Appendix E for details of these elements).For this section *Nur* is used to describe winter-run Chinook Salmon and reintroduced winter-run Chinook Salmon eggs/juveniles/adults and their habitat.

Impacts are considered significant if they would cause substantial and adverse changes to the integrity and significance of the WWT Traditional Cultural Landscape TCR including character-defining features or contributing elements. Potential impacts from the Proposed Project may be caused through:

- Physical demolition, destruction, relocation, or other alteration of character-defining features or contributing elements of the TCR such that the significance of the resource would be materially or conditionally impaired or the integrity of the resource substantially reduced compared to existing conditions.
- Elimination or substantial restriction of access of Tribal members to character-defining features or contributing elements of the TCR above levels occurring under existing conditions.
- Exposure or substantial movement of human remains or associated funerary items. Exposure of, substantial movement of, or increased access to character-defining features or contributing elements of the TCR leading to increased access and looting of tribal cultural resources above levels occurring under existing conditions.

Impact TCR-1 – Water Quality (Turbidity, Hazardous Materials, Temperature): Alter the baseline condition of water quality in a manner that would substantially and adversely change TCRs, including by substantially and adversely changing character-defining features or contributing elements of the WWT Traditional Cultural Landscape TCR such as: McCloud River, Nur, steelhead, hardhead, and other aquatic species, ethnobiological resources including *Besus* (Beaver), and ceremonial places and ceremonies on McCloud River.

4.6.3.1 Turbidity

The McCloud River and its tributaries above McCloud Reservoir can experience elevated turbidity levels as the result of natural erosion that causes sediment to enter the stream system, primarily in Mud Creek. (NMFS 2024a) The McCloud Reservoir generally acts as a sink for sediment: as turbid water enters the reservoir sediment settles to its lower levels. Turbidity data collected downstream of reservoir at The Nature Conservancy's Kerry Landreth Preserve headquarters (1.6 miles downstream of Ah-Di-Nah Campground) from 2010 through 2024 and at the USGS Gage 1168000 on the McCloud River above Shasta Lake indicates, however, that runoff events and fluctuating reservoir levels can result in the resuspension and mobilization of previously deposited fine sediment in McCloud Reservoir that causes high turbidity in the Lower McCloud River when water is released through the low-level outlet at McCloud Dam (McMillen & McBain 2024). While the specific impact of existing operations on turbidity is uncertain, turbidity is of particular concern when water is released from McCloud Reservoir during high runoff periods or other times when upstream turbidity is high. Elevated turbidity levels can significantly impact salmon egg incubation as well as other aquatic species. Elevated turbidity has impacted the WWT's ability to conduct ceremonies that require Tribal members to "see the salmon spirit in the water" at specific locations downstream of the McCloud Dam or be able or conduct other ceremonial activities that require clear water quality. The WWT notes that *Nur* ceremonies, as well as other Tribal activities on the McCloud River, have been modified due to changes from dams and other impacts. These current practices differ from those established when the river was undisturbed and had natural salmon runs.

Turbidity's Effect on Aquatic Species Contributing to WWT Traditional Cultural Landscape TCR

Implementation of management plans that involve ground disturbance or instream work could release sediment or increase turbidity in the McCloud River impacting *Nur*, steelhead, hardhead and other aquatic species that are integral to the significance of the WWT Traditional Cultural Landscape TCR. For instance, the placement of large woody debris (LWD) and gravel in the McCloud River downstream of the dam, as mandated by USFS 4(e) Condition 21 and SWB 401 Certification Cond*iti*on 4, is generally beneficial for *Nur* and ethnobiological resources including beaver populations, the McCloud River itself, and associated riparian habitats. However, performing these activities during periods of high flow may increase turbidity to levels that could adversely affect salmon egg incubation and other aquatic species. Implementation of MM WATER-1: Long-term Turbidity Control; MM WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling; MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction and Maintenance would be required to address the potential significant impact of the Proposed Project on *Nur* and other aquatic species contributing to WWT Traditional Cultural Landscape TCR from turbidity associated with ground disturbing activities.

Additionally, implementation of the Aquatic Biological Monitoring Plan (4(e) Condition 27), Erosion and Sediment Control Management Plan (4(e) Condition 22), Water Quality and Temperature Monitoring Plan (4(e) Condition 20), applicable BMPs, in consultation with the WWT and required agency permits would continue to support recovery and stewardship of key cultural species, habitats and the overall health of the WWT Traditional Cultural Landscape TCR during construction (e.g., recreation facilities) and maintenance activities.

The Proposed Project MIFs have a neutral effect on episodic turbidity events that occur in the Lower McCloud River (see Section 3.5 Hydrology and Water Quality). Turbidity during the summer/fall in the Lower McCloud River, however, is high and potentially exacerbated by the existing Hydroelectric Project and the Proposed Project would have an uncertain, but potentially significant effect on turbidity in the Lower McCloud River (Section 4.5.3.6 Turbidity). This would reduce the amount (duration) of clearwater habitat for *Nur*, which could affect growth and survival (Section 4.4.3.1 Aquatic Species) and the overall

recovery of this key cultural element of the TCR. Mitigation measures MM Water-1 and MM Water-2 (as described in the Hydrology / Water Quality Section) would help address this issue.

Overall, the Proposed Project would have no impact on hardhead or hardhead habitat but would have potentially significant impacts on *Nur* due to turbidity (see Sections 4.5 and 4.4.3.1). Implementation of MM WATER-1: Long-term Turbidity Control; MM WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling; MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction and Maintenance would be required to address the potential significant impact of the Proposed Project on *Nur*, steelhead and other aquatic species that support the cultural, spiritual, ceremonial, and traditional lifeways of the WWT from turbidity associated with MIFs.

Impact: Less than Significant with Mitigation

Mitigation Measures:

Mitigation Measure TRIBAL-1: Historical Properties Management Plan (HPMP)

In addition to United States Forest Service 4(e) Condition No. 34 and PG&E Measure 22, once the WWT ethnographic information is provided to PG&E, PG&E shall amend the HPMP as necessary to ensure that the WWT Traditional Cultural Landscape TCR is incorporated into the HPMP. PG&E shall request consultation with the WWT regarding amendment of the HPMP. If consensus regarding amendments to the HPMP cannot be reached during consultation, PG&E shall provide a record of the disputed issue(s), PG&E's statement of its positions on the disputed issues, the WWT's statement of its positions on the disputed issues, and PG&E's proposed resolution to FERC, the ACHP, and the SHPO. The WWT shall be invited as signatory to the HPMP.

Extensive consultation between the SWB and the WWT has resulted in development of information that necessitates consideration of the following amendments and additional studies as part of PG&E's update and revisions to the 2010 HPMP (required within one year of license issuance by United States Forest Service 4(e) Condition No. 34 and PG&E Measure 22). Amendments may include, but are not limited to: description and protection measures for the WWT Traditional Cultural Landscape TCR (all sections of HPMP), updates to procedures for staff training about Tribal Resources including the Tribe as trainers (HPMP Sections 5.1 and 5.7), updates to management procedures for ethnobiological resources (Section 5.6), updates to provisions for site-specific treatment measures (Section 5.7), updates to emergency protocols, including provisions of MM TRIBAL-2 (Section 5.10), and updates to treatment of inadvertent discoveries (Section 5.11). The HPMP shall acknowledge the September 27, 2023, designation of the NEP of Chinook salmon in the McCloud River under sections 10(j) and 4(d) of the ESA, and shall include protection and management of *Nur* (salmon) habitat in the McCloud River as a key character-defining feature of the WWT Traditional Cultural Landscape TCR (Section 5.7). If required by the SWB or other agency, the HPMP shall include monitoring measures or studies related to *Nur* (Section 5.15).

The applicant must agree to this mitigation measure in order for it to take effect. If the applicant does not agree to implement this mitigation measure, the impacts the measure is intended to mitigate will remain potentially significant and will be deemed significant and unavoidable in the final SEIR.

Mitigation Measure TRIBAL-2: Information Sharing

Within three months of license acceptance, PG&E shall work and consult with the affiliated Tribes to establish points of contact. If PG&E becomes aware of any event beyond its control that would

result in flows or turbidity exceeding license conditions (e.g., upstream landslides that affect the McCloud River or its tributaries) it shall notify the Tribal points of contact as soon as possible but no later than 72 hours of determining the exceedance. PG&E shall respond to inquiries from the Tribal points of contact regarding anticipated future releases from McCloud Dam as soon as possible and no later than within one week of receiving such inquiries.

The applicant must agree to this mitigation measure in order for it to take effect. If the applicant does not agree to implement this mitigation measure, the impacts the measure is intended to mitigate will remain potentially significant and will be deemed significant and unavoidable in the final SEIR.

Mitigation Measure TRIBAL-3: Tribal Consultation for Management Plans

PG&E shall request consultation with Tribes affiliated with potentially affected TCPs and TCRs regarding development and implementation of the following management plans:

- Aquatic Biological Monitoring Plan
- Project Patrol Plan
- Visual Quality Management Plan
- Erosion and Sediment Control Management Plan
- Fire and Fuels Management Plan
- Coarse Sediment Management Plan
- Large Woody Debris Management Plan
- Recreation Development and Management Plan
- Road and Transportation Facility Management Plan
- Terrestrial Biological Management Plan
- Vegetation and Invasive Weed Management Plan
- Sign and Interpretive/Education Plan
- Erosion and Sediment Control Management Plan

Other Plans Required by the 401 Certification to protect beneficial uses of the McCloud River (e.g., any necessary site-specific Water Quality Monitoring and Protection Plans)

Consultation topics should include, but are not limited to, traditional information, TCR-specific proposals and actions, management options for identification of sensitive areas, restriction of disturbances within buffer zones or installation of protective fencing, revegetation with cultural plants, and input regarding the avoidance of adverse impacts to aquatic habitat.

When plans are required by a water quality certification to be submitted to the SWB's Deputy Director of the Division of Water Rights, consultation shall occur prior to plan submittal. If disputes

regarding contents of the management plans remain after consultation, PG&E shall include a record of the disputed issue(s), PG&E's statement of its positions on the disputed issues, the Tribe's statement of its positions on the disputed issues, and PG&E's proposed resolution in a summary provided to the SWB's Deputy Director of the Division of Water Rights.

The applicant must agree to this mitigation measure in order for it to take effect. If the applicant does not agree to implement this mitigation measure, the impacts the measure is intended to mitigate will remain potentially significant and will be deemed significant and unavoidable in the final SEIR.

Mitigation Measure TRIBAL-4: Construction and Maintenance

PG&E shall comply with the SWB's Construction General Permit and amendments thereto for construction and maintenance activities to which the Construction General Permit applies. PG&E shall implement site-specific Water Quality Monitoring and Protection Plans approved by the SWB's Deputy Director of the Division of Water Rights prior to beginning any construction and maintenance activities that are not subject to the Construction General Permit.

The applicant must agree to this mitigation measure in order for it to take effect. If the applicant does not agree to implement this mitigation measure, the impacts the measure is intended to mitigate will remain potentially significant and will be deemed significant and unavoidable in the final SEIR.

Mitigation Measure WATER-1: Long-Term Turbidity Control

Mitigation Measure WATER-2: Cloud Reservoir and McCloud River Turbidity Monitoring and Modeling

Turbidity's Impact on Ceremonies and other Tribal Cultural Activities Contributing to WWT Traditional Cultural Landscape TCR

A defining characteristic of the WWT Traditional Cultural Landscape TCR is the cold and clear water of the McCloud River that enables the WWT to perform ceremonies and Tribal subsistence activities which contribute to the integrity of the TCR and to the overall health of the people and the watershed. The quality of the McCloud River is a unique aspect the TCR and is crucial for continued traditions, ceremonies, and lifeways. For example, at *Sutti Sawel*, a character-defining feature of the TCR and healing place, at minimum a swimmable flow and clear water is needed to conduct the ceremony. Other ceremonies require clear water so that people can dive or swim to rocks and communicate with the spirits/ ancestors during the ceremony. Elevated turbidity can significantly impact these cultural practices central to the TCR by disrupting the setting, feeling, association and communication with spirits/ ancestors. Proposed changes to current project operations that could increase turbidity include MIF releases, construction or reconstruction of recreational facilities, and implementation of management plans such as Gravel Augmentation and Large Woody Material management plans.

Increasing MIFs in the Proposed Project may improve water quality and benefit *Nur* and aquatic resources as discussed above by enabling higher releases at select times, provided these do not coincide with mud flows or events that raise turbidity. However, turbidity during the summer/fall in the Lower McCloud River would have a significant effect on Tribal cultural practices and ceremonies. This would reduce the amount (duration) of clear water of the McCloud River that enables the WWT to perform ceremonies and Tribal subsistence activities which contribute to the integrity of the TCR and to the overall health of the people and the watershed. Mitigation measures MM Water-1 and MM Water-2 would help this issue. Additionally, MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction and Maintenance would enhance

coordination and communication between PG&E and the WWT for water releases and ceremony timing downstream of the dam. However, according to the WWT, even with these mitigation measures, this impact is still significant and unavoidable to the Tribe's cultural, spiritual, and subsistence relationship with the McCloud River, associated ceremonies and cultural practices, and the TCR as a whole.

Impact: Significant and Unavoidable

Mitigation Measures: MM WATER-1: Long-term Turbidity Control; MM WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling; MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

4.6.3.2 Hazardous Materials

Current project operation includes routine O&M, including paved and unpaved road maintenance and repair, herbicide spraying, and pest management at recreational facilities. See also Section 4.6.3.3 (Impact TCR-4 Hazardous Materials) for a discussion of hazardous materials impacts to land-based features in the AOA. Routine O&M activities under the Proposed Project would be similar to what currently takes place but could cause impacts in addition to or different from those occurring under baseline conditions. Additional impacts could result from construction activities, routine O&M at new facilities, or implementation of new management plans, and changed impacts could result from changes to O&M at existing facilities. Increased or changed use of hazardous materials such as pesticides and herbicides may significantly impact character-defining features of the WWT Traditional Cultural Landscape TCR that rely on water quality to maintain the integrity and significance of the TCR, including *Nur*, the McCloud River and other aquatic habitat, ceremonies, fishing, swimming, and communication with spirits and ancestors.

Fuels from construction vehicles or other equipment, or chemicals from the spraying of herbicides, could potentially enter water bodies, resulting in contamination and degradation of water quality integral to the integrity and significance of the WWT Traditional Cultural Landscape TCR. The Proposed Project requires herbicide application methods to be designed to avoid sensitive aquatic habitats. Increased consultation and communication with the WWT through implementation of MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction, plus Maintenance Measures contained in the Erosion and Sediment Control Management Plan (USFS 4(e) Condition 22 and SWB Final 401 Condition 5, Erosion and Sediment Management) and SWPPP (refer to Section 4.5, Hydrology and Water Quality) will minimize the potential for degradation of aquatic habitats and ethnobiological resources contributing to the WWT Traditional Cultural Landscape TCR. With these mitigation measures and plans in place, potential adverse impacts to the WWT Traditional Cultural Landscape TCR as a result of operations and maintenance/construction activities would be less than significant.

Impact: Less than Significant with Mitigation

Mitigation Measures: MM WATER-1: Long-term Turbidity Control; MM WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling; MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

4.6.3.3 Temperature

Daily average summer water temperatures in the upper reaches of the Lower McCloud River are approximately 10°C (suitable to support *Nur* summer spawning) below McCloud Dam but warm to approximately 16°C (above the 13°C standard for Chinook salmon spawning/incubation) as the McCloud River approaches Shasta Lake.

As described above, *Nur* is intimately connected to the watershed health, and the animals and plants that depend upon the river cannot function in the same way. The overall structure and shape of the River change, and without the fisheries specifically, the Tribe's wellbeing and identity suffers, creating a potential loss of culture and traditions. The spawning gravel beds are an integral part of the WWT Traditional Cultural Landscape TCR and are much needed for *Nur* to continue. Fed by glaciers from Mount Shasta, as well as springs and deep pools, the McCloud River watershed provides cold, clean water—an ideal environment for *Nur* to thrive. The springs and deep pools provide places where the Winnemem conduct Salmon dances and ceremonies along the McCloud. WWT dance, song, and prayer—key cultural, spiritual, and economic elements—are strengthened by reconnecting with McCloud salmon.

Implementation of USFS 4(e) Condition 19 and SWB 401 Certification Condition 1, Minimum Instream Flows and Ramping Rates would increase MIFs from the current Project from McCloud Dam into the Lower McCloud River reach which would benefit and/or have a neutral effect on the amount of physical aquatic habitat available for *Nur*. This would allow cold water to penetrate further downstream, thus increasing the extent of water temperatures, and the amount of physical aquatic habitat available for *Nur* spawning and egg survival (see Section 4.4.3.1 Aquatic Species).

Slightly increased minimum flows in the Lower McCloud River during July and August, under the Proposed Project compared to the existing Hydroelectric Project (215 cfs versus 200 cfs) in normal years and 160 in dry years, would result in slightly cooler water temperatures farther downstream (Section 4.4.3.1, Figure 4-2), which would benefit *Nur,* watershed health, and the Tribe's wellbeing and identity as stewards of their TCR. The temperature at the confluence with Shasta Lake would be slightly cooler in the dry years and about the same in normal years (Figure 4-5). The modified MIFs would have a neutral effect on water temperature habitat for predator species of *Nur* such as bass potentially in the river near the confluence with Shasta Lake (see Section 4.4.3.1 Aquatic Species).

Whereas this is an improvement from the current Project (baseline conditions), these MIFs are not high enough, especially during the summer months, to maintain cold water habitat for winter-run Chinook salmon as described in the NMFS letter to the SWB providing additional information on anadromous fish, cultural resources, as well as the beneficial uses of cold freshwater habitat and cold-water spawning including Appendix 2 which provides Flow and Habitat Recommendations NMFS Recommended Federal Power Act Section 10(j) Conditions (NMFS 2024). To prevent lasting harm to *Nur* and the surrounding ecosystem central to the WWT Traditional Cultural Landscape TCR, greater water flows are required. Without the fisheries specifically, the Tribe's identity, culture, tradition, ceremonies, and lifeway suffers that would significantly impact the WWT Traditional Cultural Landscape TCR. Considering that the contributing elements and character-defining features of the WWT Traditional Cultural Landscape TCR make up the TCR as a whole, the identified mitigation measures may reduce, but will not avoid, significant long-term TCR impacts.

Impact: Significant and Unavoidable

Mitigation Measures: None applicable.

Impact TCR-2 – Flows: Alter the baseline condition of McCloud River flows in a manner that would substantially and adversely change the WWT Traditional Cultural Landscape TCR, including by substantially and adversely changing character-defining features or contributing elements of the TCR such as: McCloud River, *Nur*, steelhead and other aquatic species, ethnobiological resources including *Besus* (Beaver), and ceremonial places and ceremonies on the McCloud River.

Baseline flow conditions (under the current license) are provided above (Section 4.6.1:Existing Impairments of the McCloud River Watershed Ecosystem) and are dependent on flow requirements, and water year type among other factors. In general, mean flows (from 1974-2006) at Ah-Di-Na vary from 217 cfs in September and October to 484 cfs in March.

The WWT states that strong currents, unstable footing, and reduced access points can make participation dangerous, especially for elders and youth. Lower flows cause shallow water, poor quality, and temperature changes, affecting both physical and cultural suitability. In either case, altered flows can force ceremonies to be delayed, relocated, modified, or canceled, which directly impacts the Tribe's ability to carry out these practices in their intended and culturally appropriate form. Beyond ceremony, flow alterations affect water quality, geomorphology, and culturally significant species, including *Nur*, further disrupting the Tribe's cultural, spiritual, and subsistence relationship with the McCloud River Watershed. For these reasons, maintaining stable, predictable, and seasonally appropriate flows is essential not only for public safety, but for the protection of Tribal cultural practices, resources, and the continued exercise of traditional lifeways.

Flow's Effect on Aquatic Species Contributing to WWT Traditional Cultural Landscape TCR

As discussed in TCR-1 and in Section 4.4.3.1 Aquatic Species, implementation of USFS 4(e) Condition 19 and SWB 401 Certification Condition 1, Minimum Instream Flows and Ramping Rates would increase MIFs from McCloud Dam into the Lower McCloud River reach compared to baseline conditions during July and August and would result in slightly cooler water temperatures farther downstream which would benefit the amount of physical aquatic habitat available for *Nur*, steelhead and other aquatic species contributing to WWT Traditional Cultural Landscape TCR.

Whereas this is an improvement from the current Project (baseline conditions), these MIFs are not high enough, especially during the summer months, to maintain cold water habitat for winter-run Chinook salmon as described in the NMFS letter to the SWB (NMFS 2024). To prevent lasting harm to *Nur* and the surrounding ecosystem central to the WWT Traditional Cultural Landscape TCR, greater water flows are required. Increased consultation and participation with the WWT through implementation of MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction, plus implementation USFS 4(e) Condition 19 and the Aquatic Biological Monitoring Plan (4(e) Condition 27) would help minimize these effects, however, without enough cold water for the fisheries specifically, the Tribe's identity, culture, tradition, ceremonies, and lifeway would suffers. This would significantly impact the WWT Traditional Cultural Landscape TCR. Considering that the contributing elements and character-defining features of the WWT Traditional Cultural Landscape TCR make up the TCR as a whole, the identified mitigation measures may reduce, but will not avoid, significant long-term TCR impacts.

Impact: Significant and Unavoidable

Mitigation Measures: MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

Flow's Impact on Ceremonies and other Tribal Cultural Activities Contributing to WWT Traditional Cultural Landscape TCR

A key defining feature of the WWT Traditional Cultural Landscape TCR is the ability of the McCloud River to enable the WWT to perform ceremonies and subsistence activities which contribute further to the integrity of the TCR and to the overall health and integrity of the people and the watershed. Per discussions with the WWT, higher flows during certain times of year could contribute to potential impacts to Tribal ceremonial practices, including puberty rites, which require participants to safely enter and interact with the water under stable, predictable conditions. When flows are elevated, strong currents, unstable footing, and loss of safe access points create hazardous conditions that can prevent participation entirely, particularly for elders and youth. Altered flows can force ceremonies to be delayed, relocated, modified, or canceled, which directly impacts the Tribe's ability to carry out these practices in their intended and culturally appropriate form. In addition, adequate flows are important for the support of character-defining features such as *Nur* and the integrity of the landscape, which can be impaired if low flows result in increased algae or exposing or disconnecting sucker holes, diving holes, or ceremonial sites along the river.

As discussed in TCR-1, implementation of USFS 4(e) Condition 19 and SWB 401 Certification Condition 1, Minimum Instream Flows and Ramping Rates would slightly increase MIFs from McCloud Dam into the Lower McCloud River reach (215 cfs versus 200 cfs in normal years and 160 in dry years). In September the modified MIFs are lower in normal years (200 cfs versus 210 cfs) and higher in dry years (200 cfs versus 180 cfs) (see Section 3.2.6, Table 3-4).

Information developed for this analysis does not indicate that the decrease in flow volumes from September through December, or the increase in flow volumes during other portions of the year, would result in a reduction of days during which Lower McCloud River conditions are suitable for ceremonial uses compared to baseline conditions. Although the Proposed Project does not decrease the number of days the Lower McCloud River can be used for ceremonies, changes to baseline flow (Proposed Project MIFs) may impact ceremonial practices by requiring new access points, enhanced safety measures, and affecting the overall sense of place within the WWT Traditional Cultural Landscape TCR. Ceremonies and cultural practices that have developed in response to the current Project's flow regime would need to change to fit the Proposed Project MIFs, even if these new flows more closely resemble a natural hydrograph. Although changed flows resulting from the Proposed Project will improve conditions in the Lower McCloud River relative to the baseline, the impact of changes to the flow regime on ceremonial uses, specifically, represents a potentially significant and unavoidable impact to the WWT Traditional Cultural Landscape TCR.

Impact: Significant and Unavoidable

Mitigation Measures: MM BIO-1: Whitewater Flow Seasonality; MM WATER-1: Long-term Turbidity Control; MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

Impact TCR-3 – Physical Disturbance: Whether Proposed Project activities involving physical disturbance (instream and upland locations) may alter baseline conditions in a manner that would substantially and adversely change TCRs, including by substantially and adversely changing WWT Cultural Landscape TCR character-defining features or contributing elements such as: access to the McCloud River, ceremonial places and access to these places, *Nur*, steelhead and other aquatic species habitat, fishing sites, sucker holes, diving holes, ancestral villages/ ethnographic places, trails, archaeological sites and bedrock milling places

(including submerged archaeological sites in the reservoir), cemeteries, ancestral trails, gathering locals and ethnobiological resources, springs and water sources and access to them.

Current project operation includes routine O&M of project facilities that may result in physical disturbance in the AOA, including paved and unpaved road maintenance and repair, herbicide use and other vegetation management, fire management, and pest management at recreational facilities. Proposed project activities that involve ground disturbance including vegetation management, maintenance of recreational facilities, roads, and stream gages especially at Ah-Di-Na Campground, habitat augmentation, construction and reconstruction of recreational sites, gravel augmentation especially at the proposed Star City gravel site, and hazardous fuels reduction that may physically disturb character-defining features or contributing elements of the WWT Cultural Landscape TCR. Some of these include but are not limited to the McCloud River, ceremonial places and access to these places, fishing sites, sucker holes, diving holes, ceremonial rocks, cultural plant gardens, ancestral villages/ethnographic places, trails, and archaeological sites and bedrock milling places.

Vegetation management, revegetation activities and hazardous fuels reduction may significantly impact character-defining features of the TCR by causing loss or removal of traditional, medicinal and ceremonial plants, animals, birds, insects, fungi. Implementation of management plans could also involve physical disturbance, for example, removing gravel for the Coarse Sediment Management Plan could cause physical damage or result in erosion. Similarly, work at recreational facilities could involve ground disturbance that impacts sensitive sites, and construction of new facilities could block access or otherwise disturb character-defining features and locations of the TCR.

Physical disturbances may also result in:

- Exposure or disturbance of human remains or associated funerary items.
- Exposure, disturbance or increased access to contributing elements of the WWT TCR leading to increased access and looting of TCRs. “Looting” means the illicit collection of artifacts or other resources.
- Elimination or substantial restriction of access of Tribal members to the TCR and character-defining features above levels occurring under existing conditions.
- Substantial restriction is defined as loss of access during ceremonial windows or periods of hunting, fishing and gathering or other traditional activities associated with the TCR.

In addition to direct physical effects, project activities involving physical disturbance could materially impair the significance or integrity of the TCR by detracting from the elements of location, design, materials, feeling.

Significant impacts can be avoided through consultation with the WWT in the development of management plans and compliance with the HPMP (including potential amendments), the Construction General Permit, or site-specific Water Quality Monitoring and Protection Plans for activities not subject to the Construction General Permit.

Impact: Less than Significant with Mitigation

Mitigation Measures: MM TRIBAL-1: HPMP; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction and Maintenance.

Impact TCR-4 – Hazardous Materials: Alter the baseline condition through the release or application of hazardous materials that substantially and adversely change TCRs, including by substantially and adversely changing character-defining features or contributing elements of the WWT Cultural Landscape TCR such as ceremonial places, *Nur* (Big Salmon/winter-run Chinook salmon), the McCloud River and other aquatic species habitat, fishing sites, ancestral villages/ethnographic places, gathering locals and ethnobiological resources, springs and water sources.

Current project operation includes routine O&M, including paved and unpaved road maintenance and repair, herbicide spraying, and pest management at recreational facilities. See also TCR-1 Water Quality for a discussion of hazardous materials impacts to water quality. Implementation of management plans required by USFS 4(e) Conditions could result in changes to project operations, including routine operations and maintenance, that could affect land-based, character-defining-features or contributing elements of the WWT Traditional Cultural Landscape TCR through the use of hazardous materials in fire management, vegetation management, recreational facilities management, and road management. Use of materials such as herbicides and pesticides can affect ethnobotanical resources or non-target animals and create health risks for traditional cultural activities such as plant gathering.

Significant impacts can be avoided through compliance with the HPMP (including potential amendments)(MM TRIBAL-1), consultation with the WWT in the development of management plans (MM TRIBAL-3) and adherence to the Construction General Permit, or site-specific Water Quality Monitoring and Protection Plans for activities not subject to the Construction General Permit (MM TRIBAL-4).

Level of Significance: Less than Significant with Mitigation

Mitigation Measures: MM TRIBAL-1: HPMP; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

Impact TCR-5 – Invasive Species: Alter baseline conditions through the spread or introduction of invasive species in Project area that could substantially and adversely change TCRs, including by substantially and adversely changing character-defining features or contributing elements of the WWT Cultural Landscape TCR such as ceremonial places, ancestral villages/ ethnographic places, gathering locals and ethnobiological resources, *Nur* (Big Salmon/ winter-run Chinook salmon) and other aquatic species habitat.

Ongoing routine operations and maintenance and recreational use of sites in the project area involve activities that can result in the spread of terrestrial or aquatic invasive species. For example, recreational boating creates a risk of introducing non-native aquatic species such as bluegill, brook trout, channel catfish, and spotted bass to the McCloud River and Reservoir, and routine maintenance can result in the inadvertent spread of invasive plant species such as locust trees at Ah-Di-Na. Bass, which could be an important predator species of reintroduced winter-run Chinook salmon in the Lower McCloud River, were not observed in the sampling but are likely present in the lower river / reservoir confluence area (see Section 4.4.1).

Implementation of the USFS 4(e) Conditions could result in new or changed ongoing activities that could inadvertently introduce or spread invasive species in a manner that degrades character-defining features or contributing elements of the WWT Traditional Cultural Landscape TCR in a manner that reduces the integrity of the Landscape. Introduction or spread of invasive species can alter the utility, sense of feeling, and spirit of important ceremonial places and cultural sites: for example, gathering sites for medicinal plants can become overrun by non-native grasses, and invasive aquatic species can alter ceremonial places along or in the McCloud River or affect populations of native species that are vital features of the

Landscape. Additionally, removal of culturally valuable medicinal plants, animals, birds, insects, fungi that are considered “weeds”, “invasive” or “pests” in proposed project management plans can cause impacts to the TCR.

Significant impacts can be avoided through compliance with the HPMP (including potential amendments) (MM TRIBAL-1), consultation with the WWT in the development of management plans (MM TRIBAL-3) and adherence to the Construction General Permit, or site-specific Water Quality Monitoring and Protection Plans for activities not subject to the Construction General Permit (MM TRIBAL-4).

Impact: Less than Significant with Mitigation

Mitigation Required: MM TRIBAL-1: HPMP; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

Impact TCR-6 – Aesthetics and Noise: Alter baseline aesthetic conditions in a manner that substantially and adversely changes TCRs, including by changing the visual character or noise levels associated with character-defining features or contributing elements of the WWT Cultural Landscape TCR such as the McCloud River, ceremonial places, ceremonies, fishing sites, ancestral villages/ ethnographic places, trails, archaeological sites and bedrock milling places, cemeteries, gathering locals and ethnobiological resources, springs and water sources.

Ongoing routine operations and maintenance and recreational use of sites in the project area have altered the historical condition of the WWT Traditional Cultural Landscape TCR, including qualities related to aesthetic characteristics like visuals and noise levels. However, the Landscape still retains key character-defining features and elements that contribute to the Landscape’s overall integrity.

Implementation of USFS 4(e) Conditions, especially those that involve construction or physical disturbance (see also TCR-3 Physical Disturbance and TCR-4 Hazardous Materials) could result in changes to the aesthetic or visual character of character-defining features or contributing elements of the TCRs including the WWT Traditional Cultural Landscape TCR that could adversely impact the integrity of the TCR. For example, vegetation management can result in the removal of vegetation that alters ceremonial places or cultural sites in a manner that reduces tribal access or reduces the sense of place and feeling that is an integral component of the Landscape. Increased noise levels can reduce the value the Landscape provides for the conduct of ceremonies or other cultural activities like gathering plants.

Significant impacts can be avoided through compliance with the HPMP (including potential amendments)(MM TRIBAL-1) and consultation with the WWT in the development of management plans (MM TRIBAL-3).

Impact: Less than Significant with Mitigation

Mitigation Measures: MM TRIBAL-1: HPMP; MM TRIBAL-3: Tribal Consultation for Management Plans.

Impact TCR-7 – Terrestrial Species Habitats: Change the baseline condition in a manner that substantially and adversely changes TCRs, including by substantially and adversely changing the character-defining features or contributing elements of the WWT Cultural Landscape TCR that are associated with terrestrial species habitats.

See discussion of Impacts TCR-1, TCR-3, TCR-4, and TCR-5 above.

Impact: Less than Significant with Mitigation

Mitigation Required: MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM: TRIBAL-4 Construction and Maintenance.

Impact TCR-8 – Aquatic Species Habitats: Change the baseline condition in a manner that substantially and adversely changes TCRs, including by substantially and adversely changing the character-defining features or contributing elements of the WWT Cultural Landscape TCR that are associated with aquatic species habitats.

See discussion of Impacts TCR-1 and TCR-2 above and Section 4.4.3.1 Biological/Aquatics Resources. With mitigation, the changes resulting from the Proposed Project, including higher MIFs and Environmental Components including habitat enhancement through placing coarse gravel and large woody debris, would not be significant and may improve conditions for some aquatic species. Increased consultation and participation with the WWT through implementation of MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4 Construction, plus implementation USFS 4(e) Condition 19 and the Aquatic Biological Monitoring Plan (4(e) Condition 27) would help minimize adverse impacts to the WWT Traditional Cultural Landscape TCR. However, since the contributing elements and character-defining features including *Nur*, aquatic species and habitats of the WWT Traditional Cultural Landscape TCR collectively form the TCR, the mitigation measures identified may lessen, but will not eliminate, significant long-term impacts on the TCR. To prevent adverse effects to *Nur* and the vital ecosystem of the WWT Traditional Cultural Landscape TCR, higher water flow levels are required to maintain the clear and cold water found in the Lower McCloud River. Without fisheries, the Tribe's wellbeing and identity are negatively affected, which can significantly impact the integrity and significance of the WWT Traditional Cultural Landscape TCR.

Impact: Significant and Unavoidable

Mitigation Measures: MM BIO-1: Whitewater Flow Seasonality; MM WATER-1: Long-term Turbidity Control; MM WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling; MM TRIBAL-1: HPMP; MM TRIBAL-2: Information Sharing; MM TRIBAL-3: Tribal Consultation for Management Plans; MM TRIBAL-4: Construction and Maintenance.

4.7 RECREATION

4.7.1 Environmental Setting

FERC requires licensees to construct, maintain, and operate recreational facilities to meet recreation demand associated with any project. In addition to facilities, licensee-owned lands within the FERC boundary for hydropower projects are open to the public for recreational activities, except for lands or areas restricted for safety or security reasons (e.g., designated for hydropower operations).

The Proposed Project area lies within the remote, rugged, and densely forested McCloud River and Pit River canyons. Public recreation facilities such as campgrounds within the Proposed Project area are primitive, typically providing only vault toilets and no electrical, potable water, or other public utility connections. As a result, recreation use levels within the Proposed Project area are relatively low (approximately 33,000 recreation visitors per year).

4.7.1.1 Developed Recreation

The Proposed Project provides recreational opportunities at developed sites on McCloud Reservoir, Iron Canyon Reservoir, and Pit 7 Afterbay. There are also developed sites on the Lower McCloud River, including Ah-Di-Na Campground, Ah-Di-Na Interpretive trails, Ash Camp Campground, and Ash Camp Trailhead (these facilities are operated by the USFS and are not part of the Proposed Project). The Proposed Project also provides dispersed recreation opportunities on USFS lands and PG&E-owned lands adjacent to developed facilities on McCloud Reservoir, Iron Canyon Reservoir, James B. Black Powerhouse, Pit 6 and Pit 7 Reservoirs, and Pit 7 Afterbay/Fenders Flat. Table 4-3 and Table 4-4 display the existing recreation resources in the Proposed Project area. Additional descriptions of recreation in the Proposed Project area are provided in FERC's final EIS (FERC 2011), Section 3.3.5, *Recreation Resources*, pages 228 through 246.

Table 4-3. Developed Recreation Sites Inventoried in 2007

Recreation Resource Center	Developed Recreation Study Site
McCloud Reservoir	• Tarantula Gulch Boat Launch (also known as the Lake McCloud Boat Launch)[1]
Iron Canyon Reservoir	• Deadlun Campground[1] • Hawkins Landing Campground • Hawkins Landing Boat Launch
Pit 7 Afterbay	• Fenders Flat Boat Launch[1,2]
Lower McCloud River[3]	• Ah-Di-Na Campground • Ah-Di-Na Interpretive trails and signs • Ash Camp Campground • Ash Camp Trailhead
All access roads leading to the Proposed Project reservoirs and developed recreation facilities	• All signs providing directions to or information about each of the reservoirs and developed recreation facilities listed above. Recreation sites that were inventoried are on roads from the main county access roads to the reservoirs and developed recreation facilities.

Notes:
1 Current USFS facilities to be rebuilt and incorporated as Proposed Project-managed facilities.
2 This site does not have any developed amenities and was considered a dispersed recreation site and assessed under Task 2 of the Study Description (Nevares, Splenda, and Littlejohn 2008).
3 These facilities on the Lower McCloud River are not part of the Hydroelectric or Proposed Project.

Table 4-4. Dispersed Recreation Sites Inventoried in 2007

Recreation Resource Area	Associated Developed Recreation Facility or Area with Dispersed Recreation Activity
McCloud Reservoir	• Area between the waterline and access road encircling McCloud Reservoir (excluding privately owned land), between and including Tarantula Gulch and Star City • Island in the reservoir • Hawkins Tunnel Site
Iron Canyon Reservoir	• Deadlun Campground • Hawkins Landing Campground • Hawkins Landing Boat Launch • Area between the waterline and access road encircling Iron Canyon Reservoir (excluding privately owned land) • Iron Canyon Creek (user-created access occurring on public land)
James B. Black Powerhouse	• Across from the powerhouse and downstream of the bridge

Recreation Resource Area	Associated Developed Recreation Facility or Area with Dispersed Recreation Activity
Pit 6 Reservoir	• Along Pit 6 Powerhouse Road as it enters the canyon • Parking areas, user-created trails, and shoreline near the Pit 7 Dam
Pit 7 Reservoir and Afterbay	• Fenders Flat Area (includes unimproved boat launch and adjacent flat area) • Pit 7 Powerhouse Road between Fenders Ferry turnoff and Pit 7 • Powerhouse (including fence) • Parking areas, user-created trails, and shoreline near the Pit 7 Dam
Lower McCloud River	• Ah-Di-Na Campground • Ash Camp Campground and Pacific Crest Trail trailhead • Between Forest Road 38N53 and Lower McCloud River shoreline from about T38N R2W Section 33 near the Pacific Crest Trail crossing to the end of the road near the Nature Conservancy's McCloud River Preserve

Table 4-5 lists the proposed recreation enhancements proposed in the license.

Table 4-5. Recreation Areas with Proposed Enhancements

Recreation Resource Area	Recreation Areas
McCloud Reservoir	• Tarantula Gulch Boat Launch expansion and parking lot upgrades • McCloud Day Use Area improvements • Red Banks Day Use Area improvements • Battle Creek Day Use and Angler Access Area circulation improvements • McCloud Reservoir West Dam Angler Access Area improvements • McCloud Reservoir East Dam Access improvements • Star City Campground and Day Use Area new development • McCloud Dam Improved River Access
Iron Canyon Reservoir	• Hawkins Landing Boat Launch Ramp replacement and parking lot construction • Hawkins Landing Campground reconstruction • Deadlun Campground expansion and upgrades • Gap Creek Campground new construction • Iron Canyon Dam Boat Launch and Day Use Area and Parking Lot new construction • Three shoreline access parking areas and trails at Iron Canyon Reservoir
Pit 7 Reservoir and Afterbay	• Upper Pit 7 Reservoir Trailheads, Trail and Boat Launch improvements • Lower Pit 7 Reservoir Day Use Area improvements
Lower McCloud River	• Fenders Flat Day Use Area New Construction

Additional details on each of these recreation enhancements can be found in Section 3.2.4, Proposed Recreation Facilities.

The Proposed Project includes implementation of a Recreation Development and Management Plan. This plan describes the specific tasks, components, and products that will guide the management of recreation resources and opportunities associated with the Proposed Project. Minimum components include but may not be limited to:

- Operation and Maintenance;

- Recreation Survey and Monitoring;
- Proposed Project Patrol;
- Reservoir Water Surface Management; and
- Recreational Facility Construction (includes the construction and reconstruction of several recreational facilities near McCloud Reservoir, McCloud River below McCloud Dam, Iron Canyon Reservoir, Pit 6 Reservoir, and Pit 7 Reservoir and Afterbay).

PG&E would be required to provide reservoir water level information to the public so that visitors would be informed when conditions are suitable for launching boats on McCloud and Iron Canyon Reservoirs. PG&E would also be required to provide real-time water flow information on the internet (gage MC-1 at Ah-Di-Na) for the McCloud River below McCloud Dam to inform the public when water flows are safe for angling or suitable for whitewater boating. Overall, these measures are designed to maintain the recreational facilities and provide access to recreational opportunities throughout the Proposed Project.

4.7.1.2 Angling

Angling was the most frequent recreational use identified during the recreation survey (conducted as part of the Proposed Project relicensing studies). The Lower McCloud River is considered a “blue ribbon” trout fishery, offering excellent opportunities to fish in an undeveloped setting that receives low angling pressure. Angling use of the Lower McCloud River is affected by water releases from McCloud Dam. A relicensing study assessed Lower McCloud River flows for angling and determined that flows of 210- 375 cfs are optimal for anglers and flows of 200-475 cfs are acceptable for anglers (Nevares, Whittaker, and Shelby 2009). “Optimal” and “acceptable” angling conditions were self-defined by the anglers who participated in the study.

To facilitate use of the boat ramp during the recreation season from May 15 to October 15, PG&E voluntarily keeps the water surface elevation of Iron Canyon Reservoir at or above elevation 2,615 feet msl, instead of the minimum elevation of 2,593 feet msl allowed by the current license. In addition, SWB Final 401 Certification Conditions reflect the USFS 4(e) Conditions and FERC conditions, with modifications to provide for review and approval of not-yet-finalized management plans. Refer to Appendix C.

4.7.1.3 Whitewater Boating

Whitewater boating occurs on the Lower McCloud River. Use levels recorded during relicensing studies were low (less than five percent of total recreation activities), which is primarily due to limited access to the Lower McCloud River (Nevares, Whittaker, and Shelby 2009). Starting below McCloud Dam is a technically advanced 3.5 RM-long boating run ending at Ah-Di-Na Campground. From the campground, there is an easier 20.5 RM-long boating run ending at Shasta Lake.

The whitewater boating relicensing study identified a wide range of acceptable boating flows from 180 cfs as the minimum for “Access Based Boating”, to 1,500 to 3,000 cfs for “Big Water Boating”. When boaters were asked to identify a single preferred flow for dedicated boating releases from McCloud Dam, the median response was 800 cfs.

The current license for the Hydroelectric Project includes MIF requirements for McCloud River and Iron Canyon Creek below their respective dams (Article 31). For the McCloud River below the McCloud Dam, requirements include a MIF release of 50 cfs from May through November, and 40 cfs from December through April, as measured at gage MC-7. Stream flows in addition to the MIF requirements are determined by month and water year type and are released as necessary to maintain the 160 to 210 cfs that is required at gage MC-1, which is located below the confluence of Hawkins Creek and the McCloud River (FERC 2011).

Although boating is possible on the Lower McCloud River reach, the access is challenging. Use levels recorded during relicensing studies were low (less than five percent of total recreation activities), which is primarily due to the limited access (Nevares, Whittaker, and Shelby 2009). Starting below McCloud Dam is a technically advanced 3.5 RM-long boating run ending at Ah-Di-Na Campground. From the campground, there is an easier 20.5 RM-long boating run ending at Shasta Lake. The river provides a wide range of rapids, ranging from stretches of Class 3 along with more challenging rapids, such as Amphitheater Rapid, which American Whitewater classifies as IV+/V- rapid.

4.7.2 Regulatory Setting

4.7.2.1 Federal

Federal Clean Water Act

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Through cooperative federalism, responsibility for setting standards and issuing and enforcing permits is shared by the USEPA, USACE, states, and authorized tribes.

Under the CWA, NPDES permits are required for discharges of pollutants to navigable waters of the United States. These include any discharge to surface waters, such as lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under Section 402 of the CWA. (33 U.S.C. § 1342.)

Section 401

Section 401 of the CWA (33 U.S.C. § 1341) requires applicants for a federal license or permit that may result in a discharge into navigable waters to provide the federal licensing or permitting agency a certification from the applicable state agency that the activity to be licensed or permitted will comply with federal and state water quality standards. A federal agency may not issue a license or permit without a certification or waiver from the state or authorized tribe where the discharge originates.

In California, the SWB is the state agency with regulatory authority to issue or deny water quality certifications for hydroelectric projects licensed by FERC. The conditions of a certification issued by the SWB become mandatory conditions in the FERC license for the Proposed Project.

U.S. Forest Service, Shasta-Trinity National Forest

As stated in the 1995 STNF Land and Resource Management Plan, the overall management philosophy is to realize integrated multiple resource land management in the context of Ecosystem Management. This goal is to be achieved through the implementation of an environmental agenda that has three major facets:

- **Preservation**-the protection of unique landscapes and their wild and scenic characteristics for the indefinite future.
- **Biodiversity**-at all ecosystem scales, the maintenance of a rich diversity of plants, fish, and wildlife.
- **Sustainable Development for People**-providing high quality recreational experiences, a long- term sustained yield of timber, forage and other resource products, and services consumed by society. This last facet will be compatible with the Preservation and Biodiversity goals.

The plan provides guidance on the management of various resources within the forests, including recreation. Recreation supply is managed using the Recreation Opportunity Spectrum (ROS), a zoning tool. The forests offer a wide array of recreational opportunities, many similar to those within and near the project area. Recreation demand is periodically measured in the forest through the National Visitor Use Monitoring program. The McCloud and Pit Rivers are included as management areas within the Plan (although the areas encompass much larger areas than just the rivers). Both areas are managed for recreational opportunities while protecting sensitive resources. The 2018 National Visitor Use Monitoring (NVUM) program estimated recreation use at about 1.5 million site visits annually in the STNFs, although only a small proportion of these visitors would have been in the Proposed Project area.

The Forests offer a full range of recreational resources at Mt. Shasta, Shasta Lake, Trinity Lake, Big Bar, Hayfork, and Platina areas, in addition to the McCloud area. Over 90 campgrounds and day use areas and over 20 points of interest (e.g., boat ramps, wilderness areas, etc.) are available within the forests.

4.7.2.2 Local

Shasta County

The 2004 Shasta County General Plan includes objectives and policies to address the need to preserve unique and important aquatic, fish and wildlife habitats, and plant communities for their biological resource and ecological values, as well as for their direct and indirect benefits to the citizens of Shasta County. (County of Shasta 2004). The General Plan Open Space and Recreation Element contains the following objectives applicable to the Proposed Project:

- OSR-1 Protection of the open space and recreation resources of Shasta County for the use and enjoyment by County residents both now and in the future.
- OSR-2 Provision of public access to open space and recreation resources consistent with the need to protect these resources and the rights of private property owners.

Siskiyou County

Siskiyou County is currently in process of updating its 1973 General Plan. The 1973 General Plan does not contain objectives and policies specific to recreation that would apply to the Proposed Project. However, it does contain objectives and policies to address the need to preserve unique and important aquatic habitats, as well as for the direct and indirect benefits to the citizens of Shasta County. (Siskiyou County 1973).

4.7.3 Impacts

Additional information on environmental impacts on recreation can be found in FERC's final EIS (FERC 2011), Section 3.3.5.2, *Environmental Effects*, pages 246 through 289.

Impact REC-1: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

For the purposes of this element, a project would be considered to have a significant impact if it resulted in the permanent increased use of existing recreational facilities beyond the planned capacity of such facilities, for example by displacing recreational users from an existing recreational facility or adding residences in the vicinity of an existing recreational facility. Impacts to recreation resources are considered for: (a) overall recreation use; (b) angling on the Lower McCloud River; and (c) whitewater boating on the

Lower McCloud River. Additional information on environmental impacts on recreation can be found in FERC's final EIS (FERC 2011), Section 3.3.5.2, *Environmental Effects*, pages 246 through 289. This analysis also considers the effects on angling due to the proposed flow requirements.

4.7.3.1 Impacts to Overall Recreation Use

Each of the above recreation enhancements would require several days to two months of construction for completion. For purposes of this analysis, it is assumed that not all enhancements would be completed concurrently because PG&E plans staged construction due to personnel and equipment restraints. Staff recommended license conditions in the FERC final EIS (FERC 2011) indicate construction will occur within three years following issuance of the new license. During the three-year construction period, some existing recreation facilities being improved and areas where new facilities are being built would be closed to public use, potentially resulting in short-term recreation use impacts. Visitors desiring to use these facilities might use other recreation resources within the Proposed Project area, or the region. A common type of impact during boat launch ramp construction is a loss of access to the reservoir for recreationists launching motorized boats. At McCloud Reservoir, Tarantula Boat Launch is the only boat launch on the reservoir. During reconstruction, the boat launch would be closed during the two-month construction period. This would result in a temporary decline in motorized boating use on the reservoir, and displaced recreational users might choose to visit other recreational sites in the area as a substitute. However, construction of the boat launch would occur later in the year after the prime recreation season, and when the McCloud Reservoir is at its lowest water level. At Iron Canyon Reservoir, there is an existing boat launch that will be reconstructed and a proposed new boat launch. To maintain boating access to the reservoir during construction at these two facilities, construction of the proposed boat launch will be completed and opened to the public before reconstruction of the existing boat launch.

Based on USFS visitation estimates, the STNF receives approximately 1.5 million recreation visitors per year (USFS 2013). The Proposed Project area lies within the remote, rugged, and densely forested McCloud River and Pit River canyons. Public recreation facilities such as campgrounds within the Proposed Project area are primitive, typically providing only vault toilets and no electrical, potable water, or other public utility connections. As a result, recreation use levels within the Proposed Project area are relatively low. The temporary shift in motorized boating and related recreational use would not result in substantial increases in use in surrounding areas. STNF offers a full range of recreational resources at Mt. Shasta, Shasta Lake, Trinity Lake, Big Bar, Hayfork and Platina areas, in addition to the McCloud area. Over 90 campgrounds and day use areas and over 20 points of interest (e.g., boat ramps, wilderness areas, etc.) are available within the STNF (USFS 2018). The number of visitors displaced during construction at any one time would represent a small proportion of total annual recreation use, and sufficient capacity exists at other nearby recreation resources to accommodate temporary shifts in use. Once improvements and new recreation facilities are completed, recreation use in the Proposed Project area may subsequently increase.

4.7.3.2 Angling on the Lower McCloud River

Angling use of the Lower McCloud River is affected by water releases from McCloud Dam. A relicensing study assessed Lower McCloud River flows for angling and determined that flows of 210-375 cfs are optimal for anglers and flows of 200-475 cfs are acceptable for anglers (Nevares, Whittaker, and Shelby 2009). "Optimal" and "acceptable" angling conditions were self-defined by the anglers who participated in the study.

PG&E analyzed the McCloud River hydrograph, below McCloud Dam, for a 33-year period (1974 to 2006) and calculated the number of optimal and acceptable angling days that would occur each year under: (a) the existing instream flow requirements; and (b) the final USFS 4(e) flow requirements (i.e., the new MIFs under the Proposed Project). Under the Proposed Project new MIFs, anglers would lose a total of 143

optimal and acceptable angling days when compared to the existing MIFs over the period of record (1974 to 2006), or an average loss of about four optimal and/or acceptable angling days each year. Given the number of lost angling days is a small portion of the total angling days available in each water year type (approximately two percent), there is a very low likelihood that anglers would be displaced to other regional fishing areas. Once improvements and new recreation facilities are completed, angling use may subsequently increase.

4.7.3.3 Whitewater Boating

Under the Proposed Project MIFs boaters would gain 500 days, compared to the current MIFs over the 33-year record (1974 to 2006); or an approximate gain of 15 days per year, with flows in the 300 to 1,500 cfs flow range. Flows in the Lower McCloud under the Proposed Project would be beneficial for whitewater boaters since there would be an increase in the number of boating days per year. Once improvements and new recreation facilities are completed, whitewater boating use may subsequently increase.

4.7.3.4 Recreation and Development Management Plan

The Recreation Development and Management Plan describes the specific tasks, components, and products that will guide the management of recreation resources and opportunities associated with the Proposed Project. Minimum components include, but may not be limited to:

- Operation and Maintenance: Development and implementation of an O&M component (including fee collection and retention) for all Proposed Project recreation facilities.
- Recreation Survey and Monitoring: Development and implementation of a periodic Recreation Survey and Monitoring component with a Report that is filed with FERC after USFS approval.
- Project Patrol: Development and implementation of a Project Patrol Plan for Proposed Project and Proposed Project-affected NFS lands.
- Reservoir Water Surface Management: Development and implementation of a Reservoir Water Surface Management component that addresses recreation user safety (including surface debris capture), discourages travel onto adjacent private lands, and displays County code and contact information to Proposed Project users on each Reservoir surface (McCloud, Iron Canyon, Pit 6 and Pit 7).
- Recreational Facility Construction: Construction and reconstruction of several recreational facilities near McCloud Reservoir, McCloud River below McCloud Dam, Iron Canyon Reservoir, Pit 6 Reservoir, and Pit 7 Reservoir and Afterbay (described in more detail in Section 3.2.4).

PG&E would be required to provide reservoir water level information to the public so that visitors would be informed when conditions are suitable for launching boats on McCloud and Iron Canyon Reservoirs. PG&E would also be required to provide real-time water flow information on the internet (gage MC-1 at Ah-Di-Na) for the McCloud River below McCloud Dam to inform the public when water flows are safe for angling, or suitable for whitewater boating.

Boaters could also reference the publicly available MC-1 Gage information to target acceptable flows to optimize their use of the resource. The proposed McCloud Dam Improved River Access will include a whitewater boating put-in to improve access to the Lower McCloud River.

In addition, SWB Final 401 Condition 10, Whitewater Recreation Management Plan, requires PG&E to submit to the Deputy Director for review and approval a plan to provide whitewater recreation flows that provide adequate boating opportunities in the McCloud River throughout the term of the license. The Whitewater Recreation Management Plan will be developed in consultation with the USFS, CDFW, USFWS, American Whitewater, and SWB staff.

4.7.3.5 Summary

Overall, the additional visitors that would be drawn to the Proposed Project area and use Proposed Project and regional recreational facilities would be minimal compared to the supply of recreational resources. Additionally, the implementation of the Recreation Management and Development Plan would help alleviate these impacts through the maintenance and enhancement of recreational facilities.

Therefore, the Proposed Project would not result in an increase in the use of existing neighborhood and regional parks or other recreational facilities, which would substantially physically deteriorate these facilities, and the impact is less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

Impact REC-2: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

A project would be considered to have a significant impact if it involved the construction or operation of recreational facilities, and the analysis shows that the construction or operation would themselves cause significant environmental impacts.

The Proposed Project does include the implementation of numerous recreation enhancement activities. Many of these actions would involve ground-disturbing activities, and some are in close proximity to reservoirs or rivers. There would be short-term construction-related impacts, but these impacts would be minimized with implementation of PG&E's Environmental Management and Monitoring Plans, (discussed throughout Chapter 3 of this document). The recreational facilities that will be constructed or renovated under the Proposed Project are consistent with the rural character and existing recreational uses (e.g., camping, fishing, and boating) of the Proposed Project area.

Recreational enhancements associated with the Proposed Project could potentially result in long-term effects following construction, including localized shoreline erosion, impacts to shoreline vegetation, and increases in vehicle traffic at improved recreation sites. However, recreation-related impacts would be less than significant. Vehicle access at recreation sites would be limited to designated access roads, boat launch ramps, and parking areas, and the Proposed Project includes measures to limit uncontrolled vehicle access along the McCloud and Iron Canyon Reservoir shorelines. Several recreation enhancements are located in areas currently experiencing dispersed recreation use that has resulted in vegetation disturbance, shoreline degradation, and sanitation issues. The Proposed Project would reduce these existing impacts by directing use to designated facilities, limiting vehicle access to established roads and parking areas, and providing vault toilets and appropriate day-use and camping facilities.

Implementation of the Recreation Development and Management Plan would further reduce potentially significant recreation-related impacts to less than significant levels. In addition, implementation of the Vegetation and Invasive Weed Management Plan, Terrestrial Biological Management Plan, HPMP, and

Erosion and Sediment Control Management Plan would ensure that recreation-related impacts of the Proposed Project would be less than significant.

Impact: Less Than Significant

Mitigation Measures: None required.

5 Alternatives

5.1 ALTERNATIVES ANALYSIS

The three proposed alternatives to the Proposed Project are discussed in detail in Chapter 3, Project Description and Description of Alternatives. These alternatives include modified measures/conditions proposed by state and/or federal agencies during FERC licensing. The three alternatives evaluated in this chapter include the No Project Alternative, Alternative 1 – Whitewater Boater Flows, and Alternative 2 – Salmon Flows (Table 5-1). The analysis focuses only on the resource areas potentially affected by the alternatives presented in this chapter.

5.1.1 Alternatives Analysis and Screening Process

CEQA Guidelines Section 15126.6 establishes the basic principles for alternatives analysis, emphasizing that the discussion should focus on alternatives to the project or its location that are capable of avoiding or substantially lessening significant environmental effects, even if those alternatives would impede attainment of project objectives or result in higher costs.

The Guidelines also require evaluation of a “No Project” alternative, including a discussion of existing conditions at the time the NOP was published and reasonably foreseeable future conditions if the project were not approved, based on current plans and available infrastructure and community services.

The range of alternatives evaluated in an EIR (or SEIR) must be governed by a “rule of reason,” such that only those alternatives necessary to allow informed decision-making are analyzed. An EIR is not required to consider alternatives whose effects cannot be reasonably ascertained or that would not achieve most of the basic project objectives.

5.1.2 Alternatives Considered but Eliminated

Section 15126.6, subdivision (c) of the CEQA Guidelines requires that draft EIRs explain briefly why other alternatives were rejected.

5.1.2.1 Decommissioning Alternatives

As described in FERC’s final EIS (FERC 2011), Hydroelectric Project decommissioning could be accomplished with or without removal of the McCloud-Pit dams. Either one would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions and cessation of power generation at the Hydroelectric Project, resulting in the following effects:

- Energy currently generated at the Hydroelectric Project by a renewable resource would be lost.
- There would be significant costs involved in retiring the powerhouse and appurtenant facilities.
- The environmental enhancements currently proposed by PG&E would not be implemented.
- If the dam and control structures were removed, the original riverine habitat could not be reestablished because of the presence of Shasta dam and Shasta Lake, which inundates the Lower McCloud River and abuts the Pit 7 Afterbay. Also, the presence of Shasta Dam prevents unobstructed fish passage into areas upstream, including the Hydroelectric Project.

- If the dam and control structures were removed, the existing recreational, residential, and commercial interests around the Hydroelectric Project would be compromised.
- The potential for environmental effects such as the release of sediments accumulated behind the dam to the river downstream and loss of lacustrine habitats and wetlands could occur.

The removal of the dam and control structures, however, would restore some riverine habitat, eliminate any fish entrainment mortality that may be occurring, provide recreational riverine boating, provide the potential for future unobstructed fish passage if Shasta dam were removed, and allow the Tribes to potentially re-establish some of their traditional uses of the river that occurred prior to impoundment.

Despite these potential benefits, the SWB agrees with FERC, and does not regard this alternative as reasonable in view of the potential losses and the alternative's failure to achieve project objectives.

The second decommissioning alternative would involve retaining the dam and control structures and disabling or removing equipment used to generate power. Hydroelectric Project works would remain in place and could be used for historic or other purposes. Because the power supplied by the Hydroelectric Project is needed, a source of replacement power would need to be identified. In these circumstances, the SWB does not consider removal of the electric generating equipment to be reasonable alternative.

In addition, decommissioning is considered when an applicant actually proposes to decommission a project, or a participant in a relicensing proceeding demonstrates that there are serious resource concerns that cannot be addressed with appropriate license measures and that make decommissioning a reasonable alternative. PG&E does not propose decommissioning, nor does the record to date demonstrate there are serious resource concerns that cannot be mitigated if the project is relicensed. Accordingly, the two decommissioning alternatives described above are not considered to be reasonable alternatives to be evaluated as part of the CEQA process.

5.1.3 Alternatives Carried Forward

Three alternatives have been carried forward. Table 5-1 presents a comparative analysis of environmental impacts for the Proposed Project and its three alternatives: No Project, Whitewater Boater Flows, and Salmon Flows Below McCloud Dam. Each alternative is evaluated across key resource areas including biological resources, hydrology and water quality, TCRs, and recreation, with impact significance indicated for each criterion.

Table 5-1. Comparison of Proposed Project Impacts and Proposed Project Alternatives Impacts

Environmental Resource / CEQA Impact Criterion	Proposed Project	No Project Alternative	Alternative 1 – Whitewater Boater Flows	Alternative 2 – Salmon Flows Below McCloud Dam
Biological Resources				
IMPACT BIO-1: Adversely affect special status species or their habitats	LTSM	IG	IS	IR
IMPACT BIO-2: Harm riparian or sensitive natural communities	LTS	IG	IS	IR

Environmental Resource / CEQA Impact Criterion	Proposed Project	No Project Alternative	Alternative 1 – Whitewater Boater Flows	Alternative 2 – Salmon Flows Below McCloud Dam
IMPACT BIO-3: Adversely affect federally protected wetlands	LTS	IS	IS	IR
IMPACT BIO-4: Disrupt movement corridors for native fish or wildlife	LTS	IS	IR	IR
IMPACT BIO-5: Conflict with policies protecting biological resources	LTS	IS	IS	IS
IMPACT BIO-6: Conflict with adopted habitat conservation plans or similar	LTS	IS	IS	IS
Hydrology and Water Quality				
IMPACT WATER-1: Violate water quality standards or degrade surface water quality	LTSM	IS	IG	IG
IMPACT WATER-2: Decrease groundwater supplies or recharge	LTS	IS	IS	IS
IMPACT WATER-3i: Increase erosion or siltation	LTS	IS	IG	IG
IMPACT WATER-3ii: Increase surface runoff which contributes to flooding	LTS	IS	IS	IS
IMPACT WATER-3iii: Exceed the capacity of stormwater drainage systems or increase polluted runoff	LTS	IS	IS	IS
IMPACT WATER-3iv: Impede or redirect flood flows	LTS	IS	IS	IS
IMPACT WATER-4: Risk release of pollutants due to project inundation by flood or tsunami	LTS	IG	IS	IS
IMPACT WATER-5: Conflict with a water quality control plan or sustainable groundwater management plan	LTS	IS	IS	IS

Environmental Resource / CEQA Impact Criterion	Proposed Project	No Project Alternative	Alternative 1 – Whitewater Boater Flows	Alternative 2 – Salmon Flows Below McCloud Dam
Tribal Cultural Resources				
IMPACT TCR-1: Alter the baseline condition of water quality in a manner that would substantially and adversely change TCRs, including by substantially and adversely changing character-defining features or contributing elements of the WWT Traditional Cultural Landscape TCR	Turbidity's Effect on Aquatic Species: LTS Turbidity's Effect on Ceremonies: SU Temperature: SU Hazardous Materials: LTS	Turbidity's Effect on Aquatic Species: IR Turbidity's Effect on Ceremonies: IR Temperature: IG Hazardous Materials: IR	Turbidity's Effect on Aquatic Species: IS Turbidity's Effect on Ceremonies: IG Temperature: IR Hazardous Materials: IS	Turbidity's Effect on Aquatic Species: IR Turbidity's Effect on Ceremonies: IR Temperature: IR Hazardous Materials: IS
IMPACT TCR-2: Alter the baseline condition of McCloud River flows in a manner that would substantially and adversely change TCRs	Aquatic Species: SU Ceremonies: SU	IG	IS	IR
IMPACT TCR-3: Through physical disturbance (instream and upland locations), alter baseline conditions in a manner that would substantially and adversely change TCRs	LTSM	IS	IS	IS
IMPACT TCR-4: Alter the baseline condition through the release or application of hazardous materials that substantially and adversely change TCRs	LTSM	IG	IS	IS
IMPACT TCR-5: Alter baseline conditions through the spread or introduction of invasive species in Project area that could substantially and adversely change TCRs	LTSM	IG	IS	IR
IMPACT TCR-6: Alter baseline aesthetic conditions in a manner that substantially and adversely changes TCRs	LTSM	IG	IG	IR
IMPACT TCR-7: Change the baseline condition of terrestrial species habitats in a manner that substantially and adversely changes TCRs	LTSM	IG	IS	IS

Environmental Resource / CEQA Impact Criterion	Proposed Project	No Project Alternative	Alternative 1 – Whitewater Boater Flows	Alternative 2 – Salmon Flows Below McCloud Dam
IMPACT TCR-8: Change the baseline condition of aquatic species habitats in a manner that substantially and adversely changes TCRs	SU	IG	IS	IR
Recreation				
IMPACT REC-1: Increase the use of recreational facilities to the point where they deteriorate	LTS	IS	IS	IS
IMPACT REC-2: Require construction or expansion of recreation facilities	LTS	IS	IS	IS

Legend:
IG = Impacts Greater Compared to the Proposed Project
IR = Impacts Reduced Compared to Proposed Project
IS = Impacts Similar to Proposed Project
LTS = Less than Significant
LTSM = Less than Significant with Mitigation Incorporated

5.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Section 15126.6, subdivision (e)(2) of the CEQA Guidelines requires an environmental impact report to identify an "environmentally superior" alternative. The Environmentally Superior Alternative is the one that would avoid or substantially lessen the significant environmental effects of the proposed project to the greatest extent. The Environmentally Superior Alternative may not necessarily be the alternative that best meets all project objectives; however, it must result in superior environmental outcomes when compared to the Proposed Project and other alternatives.

As summarized in Chapter 4, Environmental Analysis, and Table 5-1, the No Project Alternative would result in continuation of existing operations under the current FERC license and associated MIFs requirements. However, the No Project Alternative would not include implementation of the environmental measures, including increased instream flows, aquatic habitat enhancements, and monitoring and management plans, that are intended to improve environmental conditions in the Project-affected reaches. As a result, the No Project Alternative would not provide environmental benefits relative to existing baseline conditions and would not improve conditions for aquatic biological resources, including salmon and continued use of the WWT Traditional Cultural Landscape TCR.

Alternative 2 – Salmon Flows below McCloud Dam (Salmon Flow Alternative) is identified as the Environmentally Superior Alternative. This option provides seasonal instream flow releases to support aquatic habitats, downstream uses, and the WWT Traditional Cultural Landscape TCR—including the McCloud River—to sustain the Tribe's cultural, spiritual, ceremonial, and traditional lifeways central to its health, and identity. The flow regime under the Salmon Flow Alternative is the most similar to historical conditions of the McCloud River among the alternatives evaluated and is expected to provide the greatest

overall benefit to salmon by improving habitat availability, supporting key life stages, and enhancing ecological processes in the downstream reach.

As analyzed, the Salmon Flow Alternative would result in environmental effects that are similar to the Proposed Project across most resource areas but would provide additional protection and enhancement of aquatic cultural and biological resources. Because it incorporates environmental measures that improve baseline conditions and provides the greatest benefit to salmon while avoiding new or substantially greater environmental impacts, the Salmon Flow Alternative best avoids or substantially lessens adverse environmental effects overall.

Accordingly, the Salmon Flow Alternative (Alternative 2) is identified as the Environmentally Superior Alternative pursuant to CEQA Guidelines Section 15126.6. Alternatives are evaluated for comparative purposes only and do not represent separate or proposed projects.

5.3 NO PROJECT ALTERNATIVE

Under the No Project Alternative, the State Water Resources Control Board would not move forward with the proposed water quality certification, and the Proposed Project would not be implemented. The McCloud-Pit Hydroelectric Project would continue to operate under the existing FERC license and annual license extensions, including existing operations, maintenance activities, recreation facilities, and MIF requirements. No new or improved recreation facilities would be constructed, no increases to MIFs would occur, and none of the additional environmental management or monitoring plans associated with the Proposed Project would be implemented.

Under the No Project Alternative, current physical and operational conditions would remain substantially unchanged. The McCloud-Pit Hydroelectric Project would continue operating with coordinated operations of McCloud and Iron Canyon Reservoirs with a focus on power generation while meeting existing MIFs requirements. No increases in MIFs for aquatic habitat enhancement, whitewater boating, or water quality improvement would occur. Existing recreation facilities would continue to operate and be maintained at current levels.

Further, the No Project Alternative would not include implementation of the environmental management and monitoring plans proposed under the Proposed Project, including plans related to aquatic biological monitoring, coarse sediment management, recreation development, vegetation management, or water quality monitoring. Existing environmental protection measures and monitoring required under the current FERC license would continue.

5.3.1 Biological Resources

Under the No Project Alternative, the Hydroelectric Project would continue to operate under the existing FERC license and annual extensions. No new mitigation measures would be implemented (e.g., gravel augmentation, LWD augmentation), and no increases to MIFs would occur. As a result, current conditions for aquatic and terrestrial biological resources would remain substantially unchanged. Existing operations would maintain MIFs as required by the current license, but there would be no enhancements of MIFs in the Lower McCloud River or in Iron Canyon Creek, gravel augmentation, or LWD augmentation in the Lower McCloud River for aquatic habitat. Consequently, potential benefits to fish populations, benthic macroinvertebrates, and riparian habitat from increased flows, gravel augmentation, and LWD augmentation would not be realized. Overall, impacts to biological resources under the No Project

Alternative would not significantly change from the baseline condition and so would be less than significant.

5.3.2 Hydrology and Water Quality

Hydrological and water quality conditions would remain as currently regulated under the existing FERC license. The No Project Alternative would not result in any changes to reservoir operations, MIFs, or water quality monitoring programs. There would be no increases in MIFs for aquatic habitat enhancement or water temperature improvement, and no new water quality monitoring or management plans, as outlined in water-related mitigation measures, would be implemented. Water quality protection measures required under the current license would continue, maintaining the existing baseline. As a result, baseline water quality issues would not be addressed through new Proposed Project actions. The impact to hydrology, water temperature, and water quality would be less than significant, as conditions would remain similar to baseline conditions, but opportunities for improvement of water temperature or enhanced monitoring would be foregone.

5.3.3 Tribal Cultural Resources

Under the No Project Alternative, the Hydroelectric Project would continue under existing operations, maintenance activities, and recreation use. The No Project Alternative would not introduce new recreational facilities or ground-disturbing activities, thereby minimizing additional impacts to the WWT Traditional Cultural Landscape TCR. PG&E would still need to prepare and implement a HPMP to comply with Section 106 of the NHPA to manage historic properties under the license. Additional environmental management and monitoring plans outlined in mitigation measures herein that could benefit the WWT Traditional Cultural Landscape TCR would not be developed and implemented, meaning that potential opportunities for enhanced protection, consultation, or mitigation for resources like *Nur* contributing to the WWT Traditional Cultural Landscape would not occur.

Additionally, increases to MIFs would not occur under the No Project Alternative, which could benefit contributing aquatic and biological resources of the WWT Traditional Cultural Landscape TCR such as winter-run Chinook salmon (*Nur*) or beaver (*Besus*). Significant and unavoidable impacts to ceremonies and other Tribal cultural activities contributing to WWT Traditional Cultural Landscape TCR from a change in MIFs would not occur. However, turbidity from Project operations would remain a problem. The existing impacts to the WWT Traditional Cultural Landscape TCR that are part of the environmental baseline would continue, and no additional protections or improvements would be implemented. However, potential impacts to WWT Traditional Cultural Landscape TCR associated with the Environmental Components of the Proposed Project, such as potential impacts associated with sourcing and depositing coarse gravel for habitat augmentation, would not occur. Compared to the Proposed Project, the No Project Alternative would provide less management and protection of the contributing features of the TCR, which means it could also result in significant and unavoidable impacts to the TCR. The WWT Traditional Cultural Landscape TCR would continue to be significantly impacted, even with HPMP in place, as project operations would still affect *Nur*, ceremonies, and WWT's way of life on the McCloud River.

5.3.4 Recreation

Under the No Project Alternative, no new or improved recreation facilities would be constructed, and existing facilities would continue to operate and be maintained at current levels. There would be no increases to MIFs for recreational uses such as whitewater boating, fishing, or swimming. Recreation

enhancement activities, including improved vehicle access or new vault toilets, would not be implemented. Current issues related to dispersed recreation, such as vegetation disturbance, shoreline degradation, and sanitation problems, would persist without targeted mitigation or facility upgrades. The impact to recreation would be less than significant, as existing facilities and operations would continue, but opportunities to improve recreational experiences and reduce environmental impacts associated with recreation would not be realized.

5.4 ALTERNATIVE 1 – WHITEWATER BOATER FLOWS

This alternative is identical to the Proposed Project in all respects except for the magnitude of whitewater boating flow releases in the McCloud River below McCloud Dam. Under this alternative, all components of the Proposed Project would be implemented. In addition to these elements, this alternative would implement enhanced whitewater boating flow releases consistent with Water Quality Certification Condition 10 (Whitewater Recreation). Rather than PG&E's proposed whitewater boating flows of 300 cubic feet per second (cfs) for 11 days per year (May 15 – June 15), this alternative evaluates higher boating flow releases, including: (1) 500 cfs for 11 days per year, and (2) a broader potential range of 500 to 900 cfs for whitewater boating events. Whitewater boating flows would be released during periods suitable for recreational use and would occur in coordination with the Proposed Project's MIFs requirements and operational constraints. These flows would be released only during the spring high flow season and would be timed to occur prior to the onset of foothill yellow-legged frog breeding, thereby avoiding effects associated with summer and early fall low-flow periods. The boating flows would include a down ramping rate that would not exceed an average of 1-inch per hour at gage No. 11367800 (McCloud R A Ah-Di-Na nr McCloud, CA) in 6-hour increments (6 inches in 6 hours) to prevent stranding of fish species. All other aspects of the Proposed Project would remain unchanged.

5.4.1 Biological Resources

This alternative is identical to the Proposed Project in all respects except for the magnitude of whitewater boating flow releases in the McCloud River below McCloud Dam. In addition to the Environmental Components, this alternative evaluates higher whitewater boating flows of 500 cubic feet per second (cfs) for 11 days per year and a broader potential range of 500 to 900 cfs. These flows would be released during the spring high-flow season, coordinated with operational constraints, and timed to occur prior to the onset of foothill yellow-legged frog breeding. No changes to Proposed Project facilities, land disturbance, or long-term flow regimes would occur under this alternative.

5.4.1.1 Aquatic Resources (Fish, Benthic Macroinvertebrates, and Aquatic Habitat)

Compared to the Proposed Project, Alternative 1 would result periodic increases in flow magnitude during spring months consistent with natural hydrology (higher spring flows and lower summer and fall flows). As discussed in Chapter 3, these flow events would occur during periods when aquatic species are generally adapted to higher and more variable flows. The flows would occur before FYLF breeding and would not affect egg masses or tadpoles.

Temporary increases in flow velocity and wetted channel area may result in minor displacement of fish and benthic macroinvertebrates; however, these species are adapted to spring high flow conditions. The proposed boating flow down ramping rate of no more than an average of 1-inch per hour at gage No.11367800 (McCloud R A Ah-Di-Na nr McCloud, CA) in 6-hour increments (6 inches in 6 hours) would protect against stranding of fish. Hunter (1992) identified 1-inch per hour as a relatively safe down ramping rate for the protection of fish stranding. The rating curve at the gage indicates that down ramping from 900 cfs to approximately 200 cfs changes the stage by 22 inches, therefore, down ramping could be

accomplished in 24 hours. The effects of down ramping would not be significant to fish. Higher boating flows would not mobilize fine sediments and organic material to the extent that it would adversely affect water quality (increases in turbidity). Overall, impacts to fish or other aquatic species, FYLF, and benthic macroinvertebrates under Alternative 1 would be less than significant and similar to those under the Proposed Project.

5.4.1.2 Special Status Fish and Aquatic Species

Alternative 1 would not introduce new adverse effects to special-status fish species. Whitewater boating flows would occur outside the critical summer egg incubation/early fry period for winter-run Chinook salmon and would not interfere with reintroduction efforts or cold-water habitat conditions. Timing the boating releases prior to foothill yellow-legged frog breeding would avoid impacts to egg masses and tadpoles. The boating flows would occur during the normal high flow season when northwestern pond turtle's life history strategy is adapted to high flows. The boating flows, therefore, would not adversely affect northwestern pond turtles. As a result, effects on special status aquatic species would remain less than significant, consistent with the Proposed Project conclusions.

5.4.1.3 Wetlands and Riparian Vegetation

Wetlands and riparian vegetation adjacent to the Lower McCloud River are primarily influenced by seasonal peak flows and long-term hydrologic patterns. The short-term boating flow releases under Alternative 1 would not alter floodplain extent, inundation frequency, or riparian recruitment processes. Minor, temporary increases in inundation of low-lying channel margins may occur during flow events, but these effects would be brief and would not result in vegetation mortality or erosion. Therefore, impacts to wetlands and riparian vegetation would be less than significant and comparable to the Proposed Project.

5.4.1.4 Rare Plants and Terrestrial Vegetation

Alternative 1 would not involve ground disturbance, vegetation removal, or changes to upland habitats. Rare plants and special status vegetation identified in Chapter 3 occur outside the active channel and would not be affected by short-duration boating flows. Accordingly, impacts to rare plants and terrestrial vegetation under Alternative 1 would be the same as those identified for the Proposed Project.

5.4.1.5 Terrestrial Wildlife (Birds and Mammals)

Alternative 1 would not change terrestrial habitat availability or structure and would not increase long-term human activity levels. Short-term boating events may result in temporary increases in human presence along the river corridor, but these effects would be limited in duration and extent and would not interfere with nesting, breeding, or movement of terrestrial wildlife. Impacts to birds and mammals would be less than significant and consistent with the Proposed Project.

5.4.1.6 Summary

In summary, Alternative 1 would not result in new or substantially greater impacts to biological resources compared to the Proposed Project. Short-duration increases in winter and spring flows associated with whitewater boating would result in temporary and localized effects on aquatic conditions but would remain within the range of natural variability and existing regulatory protections. With timing restrictions and operational controls in place, impacts to wetlands, vegetation, special-status species, amphibians, fish, benthic macroinvertebrates, and terrestrial wildlife would be less than significant. Overall, biological resource impacts under Alternative 1 would be similar to those identified for the Proposed Project.

5.4.2 Hydrology and Water Quality

Under Alternative 1, whitewater boating flows of approximately 500 cubic feet per second (cfs) would be released for a limited number of days to enhance whitewater recreation opportunities below McCloud Dam. Compared to the Proposed Project, this alternative would result in short-duration increases in instream flows, while maintaining all other operational, monitoring, and management measures. As described in Chapter 3, hydrology and water quality impacts are primarily associated with changes in flow magnitude, ramping rates, water temperature and sediment mobilization. The short-term higher flow releases are not anticipated to increase turbidity through mobilization of fine sediments different than natural high flow events. Existing Water Quality Certification conditions, including ramping rate controls, erosion and sediment management measures, and ongoing water quality monitoring, would continue to apply and are expected to limit adverse effects. Overall, Alternative 1 would not substantially degrade water quality or violate applicable water quality standards, and impacts would be less than significant with implementation of existing measures.

5.4.3 Tribal Cultural Resources

Alternative 1 would not introduce new ground-disturbing activities or physical modifications beyond those analyzed for the Proposed Project. Under Alternative 1, higher boating flow releases, including: (1) 500 cfs for 11 days per year, and (2) a broader potential range of 500 to 900 cfs for whitewater boating events to enhance whitewater recreation opportunities below McCloud Dam. Compared to the Proposed Project, this alternative would result in short-duration increases in instream flows, while maintaining all other operational, monitoring, and management measures.

5.4.3.1 Nur and Other Aquatic Species

Whitewater boating flows would occur outside the critical summer egg incubation/early fry period for *Nur* and would not interfere with reintroduction efforts or cold-water habitat conditions. The boating flows would occur during the normal high flow season when aquatic species life history strategy is adapted to high flows. Compared to the Proposed Project, Alternative 1 would result in short-duration, periodic increases in flow magnitude during winter and spring months. As discussed in Chapter 3, these flow events would occur during periods when *Nur* and other aquatic species are generally adapted to higher and more variable flows (see Section 4.4.3 regarding Aquatic Resources).

Higher boating flows may mobilize fine sediments and organic material, resulting in short-term increases in turbidity, which could negatively impact *Nur* and reintroduction efforts. However, even under the whitewater boating flow alternative, impacts to water quality would be episodic, localized, and consistent with natural high flow events. In addition, implementation of mitigation measures described in Section 4.6 plus existing Water Quality Certification conditions, including ramping rate controls, erosion and sediment management measures, and ongoing water quality monitoring, would continue to apply and are expected to limit adverse effects.

The boating flows, therefore, would not adversely affect *Nur* or other aquatic species contributing to the WWT Traditional Cultural Landscape TCR, Overall, Alternative 1 would not substantially degrade water quality or impact the TCR, and impacts would be less than significant with mitigation.

5.4.3.2 Ceremonies and Other Tribal Activities

The increase in recreational flows and public recreation along the McCloud River would significantly impact ceremonies and cultural practices contributing to the WWT Traditional Cultural Landscape TCR.

Per discussions with the WWT, higher flows during certain times of year could contribute to significant impacts to Tribal ceremonial practices, including puberty rites, that require participants to safely enter and interact with the water under stable, predictable conditions. When flows are elevated, strong currents, unstable footing, and loss of safe access points create hazardous conditions that can prevent participation entirely, particularly for elders and youth. Altered flows can force ceremonies to be delayed, relocated, modified, or canceled, which directly impacts the Tribe's ability to carry out these practices in their intended and culturally appropriate form. These ceremonies and Tribal cultural practices have been adapted to the current state of the McCloud River including impoundments such as the McCloud Dam. Changes in flows would have a significant and unavoidable impact on the Tribe's ability to conduct ceremonies and practices that are integral to the integrity and significance of the TCR. Even with TCR mitigation measures designed to improve consultation with the WWT, this would remain a significant impact.

Higher boating flows may also mobilize fine sediments and organic material, resulting in short-term increases in turbidity. Greater turbidity might affect the WWT Traditional Cultural Landscape TCR, particularly its key feature—the cold, clear waters of the McCloud River. These waters allow the WWT to carry out ceremonies and subsistence activities vital to maintaining the integrity of the TCR and supporting the health of both the Tribe and the watershed.

Increased recreational use by non-tribal members have the potential to increase under Alternative 1 due to flow management which favors whitewater boating. These activities could (and have) conflict with ceremonies and Tribal cultural practices on the McCloud River by affecting the aesthetic and spiritual qualities of riverside sites the WWT use for cultural, ceremonial, or spiritual purposes. Compared to the Proposed Project, these potential conflicts and lack of privacy for the Tribe to conduct ceremonies and other activities would increase under this alternative.

Any impact on the WWT Traditional Cultural Landscape TCR will have consequences for the entire TCR; accordingly, Alternative 1 may lead to significant and unavoidable impacts on ceremonies and Tribal cultural practices that have been developed under the existing Project's flow regime. Timing the recreational releases in consultation with the WWT as part of the TCR mitigation measures described in Section 4.6, HPMP, and other management and monitoring plans could minimize impacts to ceremonies and Tribal cultural practices, however would not fully mitigate the impacts and therefore would constitute a significant and unavoidable impact. Impacts would be greater under this alternative than under the Proposed Project.

5.4.4 Recreation

Alternative 1 would enhance whitewater recreation by providing higher, more suitable boating flows on the McCloud River, generally ranging from approximately 500 to 900 cubic feet per second during designated release periods. These flows would improve boating quality, reliability, and predictability compared to the Proposed Project and would ensure annual boating opportunities, including during dry years. Boating releases would occur on a limited number of days per year and would temporarily exceed optimal angling conditions; however, angling opportunities would remain available outside release periods. Minor, short-duration increases in use of existing recreational facilities could occur. Overall, recreation impacts would be less than significant and beneficial for whitewater boating.

5.5 ALTERNATIVE 2 – SALMON FLOWS

Alternative 2 is identical to the Proposed Project in all respects except for revised MIFs requirements below McCloud Dam to support potential reintroduction of salmonids in all life stages. This Alternative proposes MIFs suitable for winter-run Chinook salmon (and potentially spring-run Chinook salmon and steelhead) holding, spawning, incubation, and rearing. The Forest Service 4(e) MIFs are suitable for rainbow and brown trout life stages, but not necessarily suitable for reintroduced winter-run Chinook salmon. Winter-run Chinook salmon require cold holding and spawning/incubation water temperatures (<12-13˚C). Presently, adult winter-run Chinook salmon arrive at Keswick Dam on the Sacramento River beginning in January or February and spawn in June and July (primarily) (Jennings and Hendrix 2020) with incubation in spawning gravels through September/October when hatching and emergence of alevins is complete. During the summer incubation period, mortality in the Sacramento River below Keswick Dam begins to occur when temperatures exceed 12˚C (Martin 2017; Anderson et al. 2022).

While NMFS has concluded that it is likely that summer water temperatures in both the upper and Lower McCloud River continue to have a high potential to support spawning of winter-run Chinook salmon (NMFS 2024c), with reintroduction of winter-run Chinook salmon to the Lower McCloud River, summer water temperature would be a primary limiting factor for successful incubation / survival. Based on the Forest Service 4(e) MIFs, summer flow releases as measured at the Ah-Di-Na USGS Gage No. 11367800 would be 200 cfs, which would result in sub-optimal spawning habitat. Only a short reach of river below McCloud Dam (<4 miles) would remain below 12˚C in July (warmest month) of a typical year (based on median hydrology, median meteorology). Historically, unimpaired flows on the McCloud River at McCloud Dam were always greater than approximately 600 cfs with median flows (50% exceedance) greater than 850 cfs.

This Alternative would increase MIFs during June to a minimum of 250 cfs to provide near-optimal Chinook salmon spawning habitat based on the habitat versus flow relationships above and below Yét Atwan Creek (e.g., Pedersen et al. 2012a). The Alternative would also increase MIFs July through September to provide suitable water temperature for Chinook salmon incubation (Martin 2017; Anderson et al. 2022, NMFS 2010). The specific flows for water temperature were derived from the NMFS Recommended FPA Section 10(j) Conditions (NMFS 2010) based on modleing by Nevares and Pawley (2009; TM-38, see Figures A3-1 to A3-9). Future modeling may be used to refine the flows downward if they meet 12˚C to approximately Lower McCloud River river mile 12 at the Yét Atwam Creek confluence. The MIFs for this alternative are the Forest Service 4(e) flows except as outlined below for June through September. The July through September flows are based on both hydrology year types and meterology (see Nevares and Pawley (2009):

Table 5-2. Minimum Instream Flows for Alterntative 2 (July through September)

Month	Hydrology	Meteorology	Ah-Di-Na USGS Gage No. 11367800 Minimum Instream Flow Estimate to Achieve 12C at Yét Atwam Creek (cfs)	Figure Reference From Nevares and Pawley (2009)
July	Normal	Normal	400-600	A3-1
	Dry	Warm	400-600	A3-2
	Crit. Dry	Hot	~ 600	A3-3

Month	Hydrology	Meteorology	Ah-Di-Na USGS Gage No. 11367800 Minimum Instream Flow Estimate to Achieve 12C at Yét Atwam Creek (cfs)	Figure Reference From Nevares and Pawley (2009)
August	Normal	Normal	300-400	A3-4
	Dry	Warm	300-400	A3-5
	Crit. Dry	Hot	~ 400	A3-6
September	Normal	Normal	200*-300	A3-7
	Dry	Warm	200*-300	A3-8
	Crit. dry	Hot	~ 400	A3-9

*200 cfs in September is consistent with the U.S. Forest Service September minimum flow.

5.5.1 Biological Resources

Alternative 2 mirrors the Proposed Project except for revisions to MIF requirements below McCloud Dam intended to support the potential reintroduction and long-term viability of anadromous winter-run Chinook salmon and potentially other anadromous species (spring-run Chinook salmon, and steelhead). Compared to the Proposed Project, which retains Forest Service Section 4(e) MIFs developed primarily to support resident rainbow and brown trout, Alternative 2 would increase summer flows to improve cold-water habitat conditions during critical life stages of winter-run Chinook salmon. These flow changes would influence aquatic and riparian biological resources in the Lower McCloud River but would not alter Proposed Project facilities, land disturbance footprints, or operational components outside of seasonal flow management.

5.5.1.1 Aquatic Resources (Fish, Benthic Macroinvertebrates, and Aquatic Habitat)

Alternative 2 would result in beneficial effects on native fish resources relative to the Proposed Project by increasing summer flows and reducing downstream water temperatures during spawning, incubation, and early rearing periods. As described in Chapter 3, water temperature is a primary limiting factor for winter-run Chinook salmon in the Lower McCloud River, with temperatures exceeding approximately 12°C posing risks to egg survival and incubation success. By increasing June flows to approximately 250 cubic feet per second (cfs) at the Ah-Di-Na gage and maintaining enhanced flows from July through September (200 – 600 cfs), Alternative 2 would enhance spawning habitat and expand the spatial extent and duration of cold-water habitat suitable for salmonids.

These flow increases would also benefit other native aquatic species that rely on cold-water conditions, including resident rainbow trout, by improving habitat connectivity and reducing thermal stress during summer months. While higher summer flows could alter local velocity patterns and substrate conditions, these changes would be consistent with historic unimpaired flow conditions and would not be expected to result in adverse effects on fish populations. Compared to the Proposed Project, Alternative 2 would therefore improve overall aquatic habitat quality in the Lower McCloud River.

Benthic macroinvertebrate (BMI) communities, which serve as a key food source for fish and as indicators of water quality, are expected to experience neutral to beneficial effects under Alternative 2. As discussed in Chapter 3, BMI communities in the Lower McCloud River generally reflect good water quality

conditions. Increased summer flows may improve habitat stability and reduce temperature-related stress, although localized changes in sediment transport could temporarily influence community composition. These effects would be similar in nature to those analyzed for the Proposed Project and would remain less than significant.

5.5.1.2 Wetlands and Riparian Vegetation

Wetlands and riparian vegetation along the Lower McCloud River are closely tied to flow magnitude and seasonal inundation patterns. Alternative 2 would increase summer base flows but would not change the timing or magnitude of peak flows associated with winter and spring runoff events, which are the primary drivers of riparian recruitment and floodplain processes. As a result, no new or substantially different impacts to wetlands are anticipated compared to the Proposed Project.

Incrementally higher summer flows may enhance soil moisture availability and reduce drought stress in riparian vegetation adjacent to the active channel, potentially providing minor beneficial effects for riparian plant vigor. However, these changes would not alter riparian community extent or composition in a manner that would result in new impacts to special-status wetland or riparian vegetation. Therefore, effects on wetlands and riparian vegetation under Alternative 2 would be similar to or slightly more beneficial than those identified for the Proposed Project.

5.5.1.3 Special Status Fish and Aquatic Species

Alternative 2 would provide clear biological benefits for special-status aquatic species, particularly winter-run Chinook salmon, by improving temperature and flow conditions during critical life stages. As documented in Chapter 4, reintroduced winter-run Chinook salmon are highly sensitive to elevated summer temperatures during incubation, and existing Forest Service 4(e) flows may not adequately protect this life stage. By increasing summer flows, Alternative 2 would reduce the likelihood of temperature-related mortality and improve the overall feasibility of salmon reintroduction efforts.

flows and water temperatures would be more consistent with natural unimpaired hydrology during the summer / fall months. Northwestern pond turtle, are not expected to experience adverse effects from Alternative 2. The increased flows and colder water temperature could have a negative impact on the existing FYLF breeding and rearing in the Lower McCloud River. Currently, FYLF are only present in the lower portion of the river where water temperatures are warmer. The higher flows and colder water temperatures could displace FYLF from the McCloud River to the tributary streams. This would be similar to unimpaired conditions. Effects to special status aquatic species under Alternative 2 would be to return the Lower McCloud closer to unimpaired conditions. Alternative 2 would therefore have a beneficial impact on special status species compared to the Proposed Project.

5.5.1.4 Rare Plants and Terrestrial Vegetation

Alternative 2 would not introduce new ground disturbance, vegetation removal, or changes to upland habitats. As such, no impacts to rare plants or special status terrestrial vegetation beyond those evaluated for the Proposed Project are anticipated. Changes in instream flow would be confined to the active channel and immediate riparian zone and would not affect the location or viability of known rare plant occurrences documented in Chapter 4. Impacts to rare plants under Alternative 2 would therefore be the same as those identified for the Proposed Project.

5.5.1.5 Terrestrial Wildlife (Birds and Mammals)

Alternative 2 would not modify terrestrial habitats, vegetation structure, or human activity levels and therefore would not result in new or increased impacts to terrestrial wildlife, including birds and mammals. Indirect effects associated with improved aquatic productivity could provide minor beneficial effects for wildlife species that forage along the river corridor, such as riparian birds or mammals that rely on aquatic prey. However, these effects would be subtle and would not change impact conclusions relative to the Proposed Project.

5.5.1.6 Summary

In summary, Alternative 2 would result in beneficial effects on biological resources, particularly aquatic resources and special-status fish species, by improving summer flow and temperature conditions in the Lower McCloud River. Effects on wetlands, riparian vegetation, rare plants, amphibians, reptiles, and terrestrial wildlife would be similar to those identified for the Proposed Project and would remain less than significant. Compared to the Proposed Project, Alternative 2 would better support salmon reintroduction and cold-water aquatic habitat without introducing new significant biological impacts.

5.5.2 Hydrology and Water Quality

Alternative 2 would modify MIF requirements below McCloud Dam during the summer months to support the reintroduction and survival of anadromous salmonids, particularly winter-run Chinook salmon. Compared to the Proposed Project, Alternative 2 would increase summer flows at the Ah-Di-Na gage to approximately 250 cubic feet per second (cfs) in June, with enhanced flows from July through September (200 cfs – 600 cfs) to maintain colder downstream water temperatures. Flows during the remainder of the year would remain consistent with the Forest Service 4(e) requirements.

From a hydrology perspective, Alternative 2 would result in higher base flows in the Lower McCloud River during the driest and warmest months of the year. These increased releases would partially restore aspects of the river's historical flow regime, which prior to dam construction typically exceeded 600 cfs during summer months, with median unimpaired flows greater than 850 cfs. Higher summer flows would increase wetted channel area, improve hydraulic connectivity, and partially restore the magnitude of daily flows relative to the Proposed Project. While Alternative 2 would not restore fully natural hydrologic conditions due to continued dam operations and inter-basin transfers, it would represent an incremental improvement over baseline conditions with respect to summer flow magnitude and seasonal timing.

With respect to water quality, Alternative 2 is expected to improve downstream water temperature (decrease water temperature) conditions during critical summer periods. As described in Chapter 3, summer water temperature in the Lower McCloud River is strongly influenced by flow magnitude, with lower flows associated with increased downstream warming. Under existing and Proposed Project MIFs, only a limited reach of the lower river remains below 12°C during July, the warmest month of a typical year. By increasing summer flows, Alternative 2 would expand the length of river maintaining temperatures suitable for cold-water beneficial uses and reduce the frequency and duration of elevated temperatures. These temperature improvements would be beneficial relative to the Proposed Project and consistent with Basin Plan objectives for cold freshwater habitat.

Alternative 2 could result in minor secondary effects related to turbidity. Higher summer flows may dilute the effects of high turbidity events in the Lower McCloud River. As discussed in Chapter 3, turbidity in the Lower McCloud River is strongly influenced by non-Proposed Project sediment inputs from the Mud Creek watershed and by reservoir resuspension during runoff events. Higher flows in Alternative 2 would

likely reduce the concentration of sediment releases into the Lower McCloud River. Alternative 2 would continue to be subject to existing erosion control measures, ramping rate requirements, and water quality monitoring and management plans, which would limit the potential for adverse water quality effects. As with the Proposed Project, compliance with Basin Plan turbidity objectives would be addressed through ongoing monitoring and adaptive management.

Overall, Alternative 2 would result in beneficial effects on hydrology and water quality compared to the Proposed Project by increasing summer flows and improving downstream temperature conditions, while not introducing new significant adverse hydrologic or water quality impacts. Any potential short-term or localized effects related to sediment mobilization would be less than significant and similar in nature to those evaluated for the Proposed Project. Consequently, Alternative 2 would better support cold-water beneficial uses in the Lower McCloud River while remaining consistent with applicable regulatory requirements.

5.5.3 Tribal Cultural Resources

Alternative 2 modifies MIF requirements below McCloud Dam to better support the reintroduction and persistence of anadromous salmonids, including winter-run Chinook salmon (*Nur*), spring-run Chinook salmon, and steelhead. As documented in Chapter 4, *Nur* is a primary character-defining feature of the WWT Traditional Cultural Landscape TCR and is fundamental to the Tribe's cultural identity, ceremonial practices, ancestral relationships, and stewardship responsibilities. By increasing summer flows and maintaining colder water temperatures during critical holding, spawning, and incubation periods, Alternative 2 would improve conditions necessary for successful salmon reproduction compared to existing Forest Service 4(e) flows, which were developed primarily to support resident trout species.

5.5.3.1 Nur *and Other Aquatic Species*

Alternative 2 would result in beneficial effects on native fish resources relative to the Proposed Project by increasing summer flows and reducing downstream water temperatures during spawning, incubation, and early rearing periods. As described in Chapter 3 and in Section 5.5.1 water temperature is a primary limiting factor for *Nur* winter-run Chinook salmon (*Nur*) in the Lower McCloud River, with temperatures exceeding approximately 12°C posing risks to egg survival and incubation success. By increasing June flows to approximately 250 cubic feet per second (cfs) at the Ah-Di-Na gage and maintaining enhanced flows from July through September (200 – 600 cfs), Alternative 2 would enhance spawning habitat and expand the spatial extent and duration of cold-water habitat suitable for *Nur*. The increased delivery of cold water under Alternative 2 would enhance the likelihood of *Nur* salmon survival and persistence in the Lower McCloud River. For the WWT, the restoration of *Nur* is essential for maintaining their cultural identity, ensuring their continued existence as a people, preserving the McCloud River Watershed, and allowing ongoing utilization of the TCR. The presence of salmon restores primary ancestral relationships within the TCR that are both interconnected and interactive with the WWT. This relationship with *Nur* is paramount for their spiritual universe and the holistic significance of the TCR. *Nur* is an emblematic species; healthy salmon means a healthy ecosystem, watershed, and people.

Under Alternative 2, the potential for impacts to ceremonial uses of the WWT Traditional Cultural Landscape TCR from June through September would be some degree greater than the Proposed Project because flow volumes during those months would be higher than those under the Proposed Project. Even with mitigation, the potential impact of Alternative 2 to existing ceremonial uses of the WWT Traditional Cultural Landscape TCR is deemed significant and unavoidable. However, compared to the Proposed Project, Alternative 2 provides a beneficial effect on the WWT Traditional Cultural Landscape TCR by

prioritizing flow conditions that support salmon and continued use of the TCR while maintaining other Proposed Project objectives. While Alternative 2 does not completely restore natural hydrologic conditions or eliminate all impacts from the Hydroelectric Project, it offers a step forward compared to baseline conditions and the Proposed Project. This alternative better supports the protection, enhancement, and ongoing Tribal use of the WWT Traditional Cultural Landscape TCR, helping sustain the Tribe's cultural, spiritual, ceremonial, and traditional practices that are vital to their health, identity, and sovereignty. As a result, this alternative has less impacts to *Nur* and other aquatic species than the Proposed Project.

5.5.3.2 Ceremonies and Other Tribal Activities

Per discussions with the WWT, higher flows during certain times of year could contribute to significant impacts to Tribal ceremonial practices, including puberty rites, that require participants to safely enter and interact with the water under stable, predictable conditions. Altered flows can force ceremonies to be delayed, relocated, modified, or canceled, which directly impacts the Tribe's ability to carry out these practices in their intended and culturally appropriate form. These ceremonies and Tribal cultural practices have been adapted to the current state of the McCloud River including impoundments such as the McCloud Dam. Higher flows, even if they will overall benefit *Nur* and other aquatic species contributing to WWT Traditional Cultural Landscape TCR may mobilize fine sediments and organic material, resulting in short-term increases in turbidity. Changes in flows and turbidity could have a significant and unavoidable impact on the Tribe's ability to conduct ceremonies and practices that are integral to the significance of the TCR, however if the timing and quantity of flows are designed in consultation with the WWT, implementation of mitigation measures discussed in Section 4.6, and WWT involvement in the Aquatic Monitoring Plan, this Alternative would benefit the overall TCR. *Nur* is an emblematic species for the Tribe and the TCR; healthy salmon means a healthy ecosystem, watershed, and people.

If implementation of Alternative 2 is developed in consultation with WWT, it provides a beneficial effect on the WWT Traditional Cultural Landscape TCR by prioritizing flow conditions that support *Nur* and continued use of the TCR while maintaining other Proposed Project objectives. Alternative 2 alters flows and does not fully restore natural hydrology or remove all impacts from the Hydroelectric Project. However, it offers incremental improvement over both baseline conditions and the Proposed Project for the protection, enhancement, and ongoing Tribal use of the WWT Traditional Cultural Landscape. As a result, impacts to Tribal ceremonies under this alternative are less than under the Proposed Project.

5.5.4 Recreation

Alternative 2 mirrors the Proposed Project except for modifications to MIF requirements below McCloud Dam intended to support the potential reintroduction of anadromous salmonids. Compared to the Proposed Project, Alternative 2 would increase summer flows in the Lower McCloud River, with June flows increased to approximately 250 cubic feet per second (cfs) at the Ah-Di-Na gage and enhanced flows maintained from July through September. These changes would influence recreational opportunities associated with the Lower McCloud River, while all proposed recreation facilities, access improvements, and management measures would remain unchanged.

Increased summer base flows under Alternative 2 would generally result in beneficial effects for water-based recreation relative to the Proposed Project. Higher flows and cooler water temperatures would improve conditions for angling by supporting healthier cold-water fisheries and enhancing overall aquatic habitat quality. Improved salmonid habitat may also enhance the recreational fishing experience over the long-term, although salmon reintroduction itself is not dependent on recreational harvest.

Compared to the Proposed Project, Alternative 2 would therefore better support the cold-water recreational values of the Lower McCloud River during the peak summer recreation season. However, the higher water levels, attributable to the salmon flows, would be make wading in the river more challenging.

Alternative 2 would not substantially alter whitewater boating opportunities relative to the Proposed Project, as the increased summer flows would remain below the higher flow levels analyzed for designated whitewater boating events. However, slightly higher summer flows may modestly improve floatability for informal boating or wading activities without introducing safety concerns or access limitations. No changes to boating access points, parking, or facilities would occur under this alternative.

Overall, Alternative 2 would result in similar recreational conditions compared to the Proposed Project, particularly for angling and passive river recreation, but would make wading in the river (for anglers) more challenging.

6 Other CEQA Statutory Sections

6.1 INTRODUCTION

This chapter addresses the additional environmental considerations required by the CEQA that are not fully covered within the resource-specific impact analyses presented in Chapter 1. Consistent with CEQA Guidelines Sections 15126.2 and 15130, this chapter evaluates other required statutory topics for the PG&E McCloud-Pit Hydroelectric Project (FERC Project No. 2106) SEIR, including a summary of impacts found not to be significant, irreversible environmental changes, significant and unavoidable impacts, and cumulative impacts.

The analysis in this chapter is based on the impact determinations and mitigation measures identified in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, and the alternatives evaluated in Chapter 5. This chapter does not introduce new impact analyses; rather, it synthesizes and summarizes conclusions drawn elsewhere in this SEIR to address CEQA's mandatory disclosure requirements.

Specifically, Section 6.2 summarizes impacts found not to be significant, either without mitigation or after incorporation of identified mitigation measures, as presented in the analyses in Chapter 4. Section 6.3 identifies any irreversible environmental changes that would result from implementation of the Proposed Project or its alternatives. Section 6.4 identifies any significant and unavoidable environmental impacts that would remain after implementation of all feasible mitigation measures. Section 6.5 evaluates the cumulative impacts of the Proposed Project in combination with other past, present, and reasonably foreseeable future projects within the geographic scope of the analysis, with a focus on resource areas evaluated in this SEIR, including biological resources, hydrology and water quality, TCRs, and recreation.

As discussed in Chapter 2, this SEIR is being prepared pursuant to CEQA Guidelines Section 15162 to address new information of substantial importance that was not previously analyzed in the 2019 Initial Study/Negative Declaration, including updated TCRs information, the reintroduction of winter-run Chinook salmon to the McCloud River, and potential changes in recreational use associated with higher instream flows. Accordingly, the analyses in this chapter reflect the scope and focus of this SEIR and are limited to the resource areas and project components evaluated herein. The Initial Study/Negative Declaration remains valid and is incorporated by reference to the extent it does not conflict with the findings presented in this SEIR.

6.2 IMPACTS FOUND NOT TO BE SIGNIFICANT

This section summarizes environmental impacts of the Proposed Project that were evaluated in Chapter 1 of this SEIR and determined to be less than significant, either without mitigation or after incorporation of identified mitigation measures. Consistent with CEQA Guidelines Section 15126.2, these findings are based on the detailed environmental setting, impact analyses, and mitigation measures presented in Chapter 4 and are limited to the resource areas evaluated in this SEIR, including biological resources, hydrology and water quality, TCRs, and recreation.

As documented in Chapter 1, the Proposed Project has the potential to affect TCRs associated with the WWT, including the WWT Traditional Cultural Landscape centered on the McCloud River, through changes in instream flows, water quality (including turbidity and temperature), physical disturbance from construction and maintenance activities, use of hazardous materials, recreational use, and

implementation of environmental management plans. These effects could influence character-defining features of the TCRs, such as ceremonial places, access to culturally important sites, aquatic species including winter-run Chinook salmon (*Nur*), ethnobotanical resources, and the setting, feeling, and association that contribute to the integrity of the Traditional Cultural Landscape.

However, with implementation of required avoidance measures, management plans, and mitigation measures identified in Chapter 1—including amendment and implementation of the HPMP, ongoing consultation and information sharing with the WWT pursuant to AB 52 and other applicable requirements, incorporation of tribal consultation into the development and implementation of environmental management plans, compliance with water quality permits and monitoring requirements, and construction and maintenance best management practices—potential impacts to TCRs would be reduced to less-than-significant levels. These measures are intended to avoid or minimize adverse effects by protecting access to ceremonial areas, maintaining water quality and flow conditions necessary for cultural practices and aquatic resources, preventing inadvertent disturbance of cultural materials or human remains, and integrating TEK where appropriate.

The Proposed Project also includes increased MIFs, environmental management and monitoring plans, and recreation facility improvements that, when implemented with tribal consultation and applicable mitigation, would protect and, in some cases, enhance environmental conditions important to TCRs and other beneficial uses. With implementation of these measures, impacts associated with construction, operation, and maintenance of the Proposed Project would be reduced to less-than-significant levels.

No impacts were identified that would result in a substantial adverse change in the significance of a TCRs, or other environmental resource, which could not be avoided or reduced through compliance with existing regulations, certification conditions, and mitigation measures identified in Chapter 3. Accordingly, no impacts evaluated in this SEIR were found to be significant after mitigation.

6.3 IRREVERSIBLE IMPACTS

CEQA Guidelines Section 15126.2, subdivision (c), requires an EIR to identify any significant irreversible environmental changes that would be caused by implementation of a project. Irreversible impacts are generally associated with permanent changes to the physical environment or irreversible commitments of nonrenewable resources.

As evaluated in Chapter 1, implementation of the Proposed Project would not result in significant irreversible environmental changes. The Proposed Project involves continued operation of existing hydroelectric facilities, modifications to operational flow regimes, implementation of environmental management and monitoring plans, and construction or improvement of recreation facilities, most of which would occur within previously disturbed or developed areas.

While certain Proposed Project components, such as recreation facility improvements and operational changes to instream flows, would represent long-term commitments of land or water resources, these changes are intended to enhance environmental conditions, protect beneficial uses, and improve public recreation opportunities. No irreversible consumption of nonrenewable resources or permanent environmental degradation was identified. Accordingly, the Proposed Project would not result in significant irreversible environmental impacts.

6.4 SIGNIFICANT AND UNAVOIDABLE IMPACTS

CEQA requires identification of any significant environmental impacts that cannot be avoided or reduced to a less than significant level through the implementation of feasible mitigation measures. Such impacts are referred to as significant and unavoidable impacts.

Based on the analyses presented in Chapter 1 of this SEIR, the Proposed Project's impact related to turbidity and flow on ceremonies and other tribal cultural activities contributing to WWT Traditional Cultural Landscape TCR is significant and unavoidable to the Tribe's cultural, spiritual, and subsistence relationship with the McCloud River even after mitigation. In addition, temperature-related impacts to *Nur* are significant and unavoidable because although the Proposed Project flows improve temperature conditions, the flows are not high enough to support cold temperatures which would contribute to long-term recovery of *Nur*.

6.5 CUMULATIVE IMPACTS

6.5.1 Introduction

CEQA requires a lead agency to determine whether a project has possible environmental effects that may be individually limited but "cumulatively considerable," meaning the incremental impacts of a project are significant when viewed in connection with effects of past projects, current projects, and probable future projects. (14 CCR §§ 15065(a)(3), 15130.) Cumulative impacts can result from the combined impacts of a single project or from a number of separate projects. (14 CCR § 15355(a).) A cumulative impacts analysis allows a lead agency to consider the present project in the context of other activities that may have significantly affected the environment: the cumulative impacts analysis goes beyond the basic CEQA question of what changes a proposed project would cause to the baseline condition by providing for a determination regarding whether the present project's contribution to an impact should be considered significant in light of problems caused by other projects.

A cumulative impact can be significant even if the project-specific impact is not; however, if the project does not contribute to an adverse impact it is not part of a cumulative impact. In addition, a project's contribution to a significant cumulative impact can be deemed to not be cumulatively considerable if the contribution is adequately mitigated. (14 CCR § 15130(a)(3).) Only the project's contribution to the cumulative impact must be mitigated. (14 CCR 15130(b)(5).) Discussion of cumulative impacts is guided by standards of practicality and reasonableness and is not required to provide the same level of detail as is provided for project-specific effects. (14 CCR § 15130(b).)

The significance criteria used for this analysis are identical to the criteria used to analyze the individual project impacts, but the potential classifications of the impacts differs due to CEQA's distinct treatment of the cumulative impacts analysis. The potential classifications are as follows:

- Beneficial cumulative effects – when effects are cumulatively beneficial.
- No significant cumulative impact – when the combined impact of the Proposed Project and other projects would not be significant and adverse (and would also not be beneficial with sufficient certainty to describe it as such).

- Not cumulatively considerable – when the combined impact of the Proposed Project and other projects would be significant and adverse, but the incremental contribution of the Proposed Project would not be cumulatively considerable.

- Not cumulatively considerable with mitigation – when the combined impact of the Proposed Project and other projects would be significant and adverse, and the incremental contribution of the Proposed Project requires mitigation to reduce it to less than cumulatively considerable.

- Cumulatively considerable – when the combined impact of the Proposed Project and other projects would be significant and adverse, and the incremental contribution of the Proposed Project is cumulatively considerable (and there is no feasible mitigation).

6.5.2 Approach to Analysis

CEQA generally recommends using one of two approaches to analyze cumulative impacts: either a list approach, which involves identifying past, present, and probably future projects producing related or cumulative impacts, or a projection approach, which relies on a summary of projections contained in adopted or certified planning documents that describe or evaluate regional or area-wide conditions contributing to cumulative impacts. (14 CCR § 15130(b)(1).)

This analysis uses an augmented projection approach: it relies on FERC's EIS, the SWB's IS/ND, and the Shasta County General Plan (2004) and additionally considers potential cumulative impacts to winter-run Chinook salmon, the reintroduction and designation of a NEP of which had not yet occurred when the prior studies were completed, and to the WWT Traditional Cultural Landscape TCR, which had not been defined for the purposes of the prior studies. Finally, while events like wildfires and mud- or landslides are properly defined as "emergencies" and not "projects" under CEQA, where appropriate this analysis includes consideration of whether the potential impacts of projects that contribute to cumulative impacts will be exacerbated by climate trends that may increase occurrences of wildfires and landslides. The geographical scope of this analysis includes the APE and the AOA defined in other chapters of this SEIR.

FERC's EIS cumulative impacts analysis focuses on effects on water resources and fisheries resources within the McCloud River and Pit River, including water temperatures, turbidity, and fish species. It notes that the existing McCloud project modifies the duration, distribution, and dissipation of natural mudflows from Mud Creek, and that the existing McCloud project dams as well as the construction of the Shasta and Keswick dams act as barriers to upstream fish migration. (FERC EIS p. 150.)

The IS/ND addressed potential cumulative impacts to a variety of potential impact areas. (IS/ND pp. 3-197 to 3-199). It determines that the Proposed Project is consistent with Shasta County General Plan projections and will not result in a cumulatively considerable contribution to land use and planning, noise, population and housing, public services, and utilities and service systems. For air quality and GHG emissions, the IS/ND determines that the Proposed Project would be consistent with applicable plans and so would not result in a cumulatively considerable contribution to air quality and GHG emissions impacts. The IS/ND notes that the Proposed Project area contains no agricultural land and so will have no impact on agricultural resources, and that while the Proposed Project will involve changes to timberland resources, the total area of disturbance is expected to be less than 50 acres—such a small percentage of the total timberland in the region that the individual contribution to forest resource impacts would not be cumulatively considerable.

For aesthetics, biological resources, cultural resources, mineral resources and geology and soils, hazards and hazardous materials, hydrology and water quality, recreation, and traffic and transportation, the IS/ND concludes that the Visual Quality Management Plan, the Aquatic Biological Monitoring Plan, the Erosion and Sediment Management Control Plan, the Large Woody Debris Plan, the HPMP, the Spill Prevention, Control and Countermeasure Plan, the Fire and Fuels Management Plan, the Terrestrial Biological Management Plan, the Vegetation and Invasive Weed Management Plan, the Road and Transportation Facility Management Plan, and the Water Quality Monitoring Plan, in addition to new ramping rates and higher MIFs that are part of the Proposed Project would render the Proposed Project's individual contribution to potential cumulative impacts not cumulatively considerable.

The Shasta County General plan describes land uses, public services, and management of timberland, fish and wildlife (including the establishment of Coordinated Resource Management and Planning Groups (CRMPs) one of which has been established for the McCloud River), water quality and sediment, and heritage resources including sites and structures of architectural, historical, archaeological, or cultural significance. As noted above, the Proposed Project would be consistent with the projections in the Shasta County General Plan and so would not have a cumulatively considerable impact on land use and planning, noise, population and housing, public services, and utilities and service systems.

6.5.3 Analysis

6.5.3.1 Impact Cumulative-1: Water Temperature

Existing McCloud project operations have altered the natural hydrograph in the McCloud River, which results in baseline water temperatures below McCloud Dam that can be higher than would occur under natural conditions. Warmer water temperatures in rivers can increase fish mortality and prevent successful incubation of fish eggs. Daily average summer water temperatures in the upper reaches of the Lower McCloud River are approximately 10°C (suitable to support summer spawning of winter-run Chinook salmon) but warm to approximately 16°C (above the 13°C standard for spawning/incubation) as the river approaches Shasta Lake. Currently, temperatures above the 13°C standard in some portions of the Lower McCloud River do not prevent winter-run Chinook salmon from spawning, as is demonstrated by CDFW's documentation of spawning in the Lower McCloud River in July 2025. However, climate change may exacerbate the existing effect if it results in a general increase in water temperatures in any season.

Flows under the Proposed Project would be higher in most months than the baseline condition, and it is anticipated that this will result in colder water penetrating further down the Lower McCloud River. A greater extent of colder temperatures in the Lower McCloud River would be an improvement over the baseline condition, but because the baseline condition is an already-impaired condition, the cumulative impact cannot be deemed beneficial. Instead, there is an overall adverse cumulative impact on water temperatures, though the changes resulting from the Proposed Project will not result in a cumulatively considerable contribution to that impact.

Determination: **Not cumulatively considerable.**

6.5.3.2 Impact Cumulative-2: Turbidity

Existing McCloud project operations alter the natural duration, distribution, and dissipation of sediment that enters the McCloud River due to natural mud- or landslide events. As some mudslide events, including those that occur in the vicinity of Mud Creek are a product of glacial melting, a warming climate

could exacerbate the effect of any increases in turbidity resulting from the Proposed Project. While, as noted above, winter-run Chinook salmon spawning was documented in the Lower McCloud River in July 2025 despite turbid water resulting in low instream visibility, the precise extent of the effect of existing operations on turbidity patterns in the McCloud River has not been clear and more study is needed to determine how future operations under the Proposed Project would affect turbidity and what action would be appropriate to mitigate increases in turbidity that affect resources in the project area. Mitigation Measures WATER-1: Long-term Turbidity Control and WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling require monitoring and development of specific actions to better understand and address turbidity impacts resulting from the Proposed Project. Mitigation Measure TRIBAL-4: Construction and Maintenance requires either compliance with the Construction General Permit or implementation of site-specific Water Quality Monitoring and Protection Plans for construction and maintenance activities associated with the Proposed Project.

This analysis conservatively concludes that the overall cumulative effect on turbidity is significant and adverse and that without mitigation the Proposed Project would have a cumulatively considerable contribution to the overall effect. With implementation of the mitigation measures, however, the changes in turbidity resulting from the Proposed Project will not result in a cumulatively considerable contribution to the cumulative turbidity impact.

Determination: **Not cumulatively considerable with mitigation.**

6.5.3.3 Impact Cumulative-3: Hazards/Hazardous Materials

Existing project operations and maintenance involve activities (such as maintenance of roads and physical project facilities, vegetation and pest management) that may involve use of hazardous materials that can be released into the environment. The use of tools and vehicles for maintenance poses a risk of spills or leaks of oil, gas or other materials, and the use of pesticides or herbicides during vegetation and pest management activities can result in inadvertent contamination of areas not targeted for treatment. Changing climate patterns have the potential to alter how O&M is conducted—for example, concern regarding increase prevalence of wildfires could result in more aggressive vegetation or fuels management. O&M under the Proposed Project will likely be similar to what currently takes place, but could vary in timing, intensity, duration, and specific practices used. In addition, some maintenance needs, such as rehabilitation of malfunctioning equipment, cannot be anticipated with accuracy.

However, Mitigation Measure TRIBAL-4: Construction and Maintenance requires either compliance with the SWB's Construction General Permit and amendments thereto or implementation of site-specific Water Quality Monitoring and Protection Plans prior to beginning construction and maintenance activities. In addition, as discussed in more detail below, Mitigation Measure TRIBAL-3: Tribal Consultation for Management Plans requires consultation with the WWT regarding components of the Proposed Project that could result in release of hazardous materials. Implementation of mitigation would prevent the Proposed Project's contribution to the cumulative effect from being cumulatively considerable.

Determination: **Not cumulatively considerable with mitigation.**

6.5.3.4 Impact Cumulative-4: McCloud River Flows

Existing project operations have altered the natural hydrograph of the Lower McCloud River such that the volume of flows at Ah-Di-Na throughout the year range from 160-210 cfs in normal years and 160-180 cfs in dry years. The altered flow regime has resulted in changes to river morphology and water quality factors (including but not limited to temperature and turbidity) that can significantly and adversely affect

various resources including the WWT Traditional Cultural Landscape TCRs and aquatic biological resources.

The Proposed Project includes changes in releases from McCloud Dam that are anticipated to improve flow conditions in the Lower McCloud River relative to existing conditions, and so the Proposed Project's incremental contribution to the cumulative impact is not cumulatively considerable. Even with the improved flow regime, however, the cumulative effect on flows is not expected to be sufficient to restore conditions to the natural hydrograph and so the cumulative effect cannot be deemed beneficial.

Determination: **Not cumulatively considerable.**

6.5.3.5 Impact Cumulative-5: Aquatic Biological Resources

Construction of operation of existing projects, including Shasta Dam and facilities associated with the existing McCloud-Pit Project, have resulted in notable changes to natural aquatic conditions in the McCloud and Pit River portions of the Sacramento River watershed. The effects include altered geomorphology and water quality resulting from changes to the natural hydrographs of the rivers and reduced natural distribution of habitat components like coarse gravels and LWD.

Construction of dams created reservoirs where bass and other aquatic species thrive, while habitat or access to habitat for some native species, including winter-run Chinook salmon and Pacific lamprey, has been lost. A combination of factors, including reduced access to habitat and food sources, contributed to the extirpation of bull trout from the area in the 1970s. While the overall significant and adverse cumulative impact has recently improved for salmonids due to the designation of the ESA section (10(j)) experimental population of winter-run Chinook salmon and several years of reintroduction efforts, overall for aquatic biological resources including fish, amphibians, insects, and aquatic plants, the cumulative effect is significant and adverse.

The new flow regime and components of the Proposed Project such as habitat augmentation actions are anticipated to result in improvements to instream conditions, especially with inclusion of traditional tribal information as contemplated by Mitigation Measure TRIBAL-3: Tribal Consultation for Management Plans and compliance with the HPMP as amended in accordance with Mitigation Measure TRIBAL-1: HPMP. However, construction or maintenance activities could result in sediment or other materials being released into waterways and the effect of changes to flows associated with the Proposed Project on factors like turbidity is unclear. Mitigation Measure TRIBAL-4: Construction and Maintenance requires either compliance with the SWB's Construction General Permit and amendments thereto or implementation of site-specific Water Quality Monitoring and Protection Plans prior to beginning construction and maintenance activities, and Mitigation Measures WATER-1: Long-term Turbidity Control and WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling require monitoring and development of specific actions to better understand and address turbidity impacts resulting from the Proposed Project. Without mitigation, the contribution would be cumulatively considerable, but if the mitigation measures are implemented, the incremental contribution of the Proposed Project's changes to the cumulative impact will not be cumulatively considerable.

Determination: **Not cumulatively considerable with mitigation.**

6.5.3.6 Impact Cumulative-6: Tribal Cultural Resources

Cumulatively, construction and operation of water storage and power producing dams and associated facilities, as well as construction and operation of recreational facilities, power production operations, and

recreational uses in the project area has significantly and adversely affected tribal cultural resources in the project area, including the WWT Traditional Cultural Landscape TCR.

Important cultural sites have been inundated by construction of dams, and the construction and operation of dams has prevented anadromous fish from accessing historical habitat that includes cold waters needed for spawning and development of young. The construction and past and present operation of McCloud Dam has also affected habitat in the Lower McCloud River that supports winter-run Chinook salmon (*Nur*) and other species. Some important cultural sites that have not been inundated by construction of dams have otherwise been disturbed physically and aesthetically by construction, O&M of facilities (including use of equipment or hazardous materials, and recreational activities. Alterations to river flows and water quality (specifically turbidity) can affect ceremonial uses of the affected waters and culturally significant species including salmon. O&M activities can affect terrestrial components of TCRs, including through removal of culturally important plants and the inadvertent spread of invasive species.

Mitigation is necessary to ensure that the incremental changes resulting from the Proposed Project (including components generally anticipated to improve conditions, such as coarse gravel and LWD augmentation in the Lower McCloud River and an improved flow regime) do not result in a cumulatively considerable contribution to the overall cumulative effect. Mitigation Measures WATER-1: Long-term Turbidity Control, and WATER-2: McCloud Reservoir and McCloud River Turbidity Monitoring and Modeling require monitoring and development of specific actions to better understand and address turbidity impacts resulting from the Proposed Project. Mitigation Measure TRIBAL-1: The HPMP should be appropriately amended to ensure it includes the WWT Traditional Cultural Landscape TCR and resources related to the Pit River Tribe. Mitigation Measure TRIBAL-2: Information Sharing ensures that details are communicated so the WWT can better understand how proposed project activities might impact ceremonies and other activities on the McCloud River. Mitigation Measure TRIBAL-3: Tribal Consultation for Management Plans requires consultation regarding project components that could affect TCRs, and Mitigation Measure TRIBAL-4: Construction and Maintenance requires either compliance with the Construction General Permit or implementation of site-specific Water Quality Monitoring and Protection Plans for construction and maintenance activities associated with the Proposed Project.

The Proposed Project MIFs provide a short-term benefit with improved conditions compared to baseline for *Nur* and aquatic resources contributing to WWT Traditional Cultural Landscape TCR. Even with mitigation measures in place, these flows may remain cumulatively considerable, as they are insufficient—according to NMFS and CDFW—to sustain and restore *Nur* in the McCloud River. This concern is heightened by rising temperatures attributable to climate change and other contributing factors (refer to Section 6.5.3.1). As discussed in Alternative 2- Salmon Flows, for the WWT, the restoration of *Nur* is essential for maintaining their cultural identity, ensuring their continued existence as a people, preserving the McCloud River Watershed, and allowing ongoing utilization of the TCR. The presence of salmon restores primary ancestral relationships within the TCR that are both interconnected and interactive with the WWT.

The cumulative effects of altered flows on ceremonial uses in the WWT Traditional Cultural Landscape TCR could remain significant even with mitigation. Similarly, increased turbidity (see Section 6.5.3.2) may have considerable impacts on *Nur*, aquatic resources, ceremonies, and other Tribal practices along the McCloud River that are integral to the TCR.

Determination: **Cumulatively considerable for *Nur* and ceremonial uses of the WWT Traditional Cultural Landscape TCR.**

7 List of Preparers

This SEIR was prepared under the direction of the Lead Agency by a team of environmental professionals with expertise in CEQA compliance and the environmental issue areas addressed in this document. Key contributors to the preparation of this SEIR are identified below.

7.1 LEAD AGENCY / PROJECT TEAM

Lead Agency Reviewers
Adam Cohen, SWRCB
Savannah Downey, SWRCB
Amanda Pearson, SWRCB
Parker Thaler, SWRCB

Project Description
Kendra Ryan, Stantec

Project Manager Review
Kendra Ryan, Stantec
Bill Spain, Stantec

CEQA Reviewer
Caitlin Barns, Stantec

7.2 TECHNICAL PREPARERS

Biological Resources
Craig Addley, The Addley Group
Robyn Smith, Janelle Nolan Associates Environmental Consulting

Hydrology and Water Quality
Craig Addley, The Addley Group

Recreation
Bill Spain, Stantec

Tribal Cultural Resources
Crystal West, Stantec

Tribal Consultation
Shelley Davis King, Davis King & Associates

8 References

Albion Environmental, Inc. 2012. *Pacific Gas and Electric Company McCloud-Pit Hydroelectric Project FERC Project No. 2106, Confidential Ethnographic Archival Research Study Description CR-S2, Winnemem Wintu Tribe*. Submitted to the Federal Energy Regulatory Commission, Washington, D.C.

Ambrose, Jonathan. 2019. "Reintroduction of Winter Run Chinook Into The McCloud River Jon Ambrose NOAA NMFS." YouTube, May 21, 2019. Available at: www.youtube.com/watch?v=u58FQQfY150.

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Bauman, James 1981. *The Harrington Collection of Indian Place Names in North Central California*. Report on file, Shasta-Trinity National Forest, Redding, California.

Blakeslee, M., and S. Kettenhorn. 2010. Earthquake hazard and segmented fault evolution, Hat Creek Fault, Northern California. American Geophysical Union, Fall Meeting 2010.

Bureau of Reclamation (Reclamation). 2025. Long-Term Operations of the Central Valley Project and State Water Project. Available at: Bureau of Reclamation. Accessed March 19, 2026.

Calflora. Information on California plants for education, research, and conservation [web application]. Berkeley, California: The Calflora Database [a non-profit organization]. Accessed October 2017. Electronic Database. Available at: https://calflora.org/.

California Air Resources Board (CARB). 2012. Statewide Portable Equipment Registration Program. Available at: https://ww2.arb.ca.gov/our-work/programs/portable-equipment-registration-program-perp.

California Air Resources Board (CARB). 2014. Air Monitoring Sites – Interactive Map. July 22. Available at: https://www.arb.ca.gov/qaweb/mapdemo/map_module.php. Accessed in March 2019.

California Air Resources Board (CARB). 2018. Area Designations Maps/State and National. Available at: https://www.arb.ca.gov/desig/adm/adm.htm.

California Air Resources Board (CARB). 2018a. Air Quality and Meteorological Information System. Available at: https://www.arb.ca.gov/aqmis2/aqmis2.php. Accessed August 2018.

California Air Resources Board (CARB). 2018b. Shasta County AQMD List of Current Rules. Available at: https://ww3.arb.ca.gov/drdb/sha/curhtml/r3-16.pdf. Accessed August 2018.

California Air Resources Board (CARB). 2019. iADAM: Air Quality Data Statistics. Available at: https://www.arb.ca.gov/adam/.

California Department of Conservation (DOC). 2010. The California Land Conservation (Williamson) Act 2010 Status Report. Available at:

https://www.conservation.ca.gov/dlrp/wa/Documents/stats_reports/2010%20Williamson%20Act%20Status%20Report.pdf. Accessed August 2018.

California Department of Conservation (DOC). 2013. Publications of the SMARA Mineral Land Classification Project: Dealing with Mineral Resources in California. March 2013. Available at: https://www.conservation.ca.gov/cgs/Documents/SMARA_Publications_March_2013.pdf. Accessed August 2018.

California Department of Conservation (DOC). 2016. Farmland Mapping and Monitoring Program: Shasta County Important Farmland 2008. Available at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/sha16.pdf. Accessed August 2018.

California Department of Fish and Wildlife (CDFW). 2004. Lower McCloud River Wild Trout Area, Fishery Management Plan 2004 through 2009. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=60019. Accessed June 6, 2013.

California Department of Fish and Wildlife (CDFW). 2008. Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

California Department of Fish and Wildlife (CDFW). Fully Protected Animals. Available at: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html. Accessed January 2018.

California Department of Fish and Wildlife (CDFW). 2024. Gray Wolf. Online Resource. Available at: https://wildlife.ca.gov/Conservation/Mammals/Gray-Wolf.

California Department of Fish and Wildlife (CDFW) 2025a. Internal memorandum dated July 16 from Michael Memeo to Matt Johnson re “Observations of winter-run Chinook Salmon Spawning in the lower McCloud River on July 15, 2025.”

California Department of Fish and Wildlife (CDFW) 2025b. Internal memorandum dated August 8 from Michael Memeo to Matt Johnson re “Documentation of Winter-Run Chinook Salmon Spawning in the Lower McCloud River July 2025.”

California Department of Forestry and Fire Protection (Cal Fire). 2008. Very high fire hazard severity zones in LRA: Shasta County. Fire and Resource Protection Program. May 21, 2008. Available at: https://osfm.fire.ca.gov/media/6806/fhszl_map45.pdf.

California Department of Resources, Recycling and Recovery. 2018. Solid Waste Information System: Anderson Landfill, Inc. (45-AA-0020). Available at: https://www2.calrecycle.ca.gov/SWFacilities/Directory/45-AA-0020/Detail. Accessed August 2018.

California Department of Toxic Substances Control (DTSC). 2018. EnviroStor database: Shasta County. Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed August 2018.

California Department of Transportation (Caltrans). 2018. California scenic highway mapping system. Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed August 2018.

California Department of Water Resources (DWR). 2005a. California Water Watch. Hydrologic Regions. Available at: https://cww.water.ca.gov/regionscale

California Department of Water Resources (DWR). 2015. California's Groundwater Update 2013. April 2015. Available at: https://cawaterlibrary.net/wp-content/uploads/2017/05/GWU2013_Ch7_SacramentoRiver_Final.pdf. Accessed October 2018.

California Department of Water Resources (DWR) 2021. Letter from Karla A. Nemeth, Director, to Winnemem Wintu Tribe, dated March 11 re "Winnemem Wintu Tribe Support for DWR Prop 1 Proposal."

California Department of Water Resources (DWR). 2022. Juvenile Salmon Collection System. Available at: https://water.ca.gov/Programs/Integrated-Regional-Water-Management/Fish-Passage-Improvement-Program/Juvenile-Salmon-Collection-System. DWR, Sacramento, CA.

California Energy Commission (CEC). 2017. Renewables Portfolio Standard Eligibility, Ninth Edition (Revised). Available at: https://www.energy.ca.gov/programs-and-topics/programs/renewables-portfolio-standard. Accessed October 2019.

California Energy Commission (CEC). 2018. Installed In-State Electric Generation Capacity by Fuel Type (MW). Available at: http://www.energy.ca.gov/almanac/electricity_data/electric_generation_capacity.html. Accessed August 2018.

California Geological Survey. 2006. Aggregate Availability in California. Available at: https://www.conservation.ca.gov/cgs/Documents/MS_052_California_Aggregates_Map_201807.pdf. Accessed August 2018. Updated 2018.

California Independent System Operators (CAISO). 2012. Renewables Integration Studies Update. Available at: http://www.caiso.com/Documents/RenewablesIntegration_StudiesUpdate_Feb10_2012.pdf. Access ed in April 2012.

California Native Plant Society (CNPS). Inventory of Rare and Endangered Plants of California. Accessed January 2018. Electronic Database. Available at: http://www.rareplants.cnps.org/.

California Native Plant Society (CNPS). 2024. Inventory of Rare and Endangered Plants of California. Electronic Database. Available at: https://www.rareplants.cnps.org/. Accessed October 2024.

California Natural Diversity Database (CNDDB). 2018. Rare Find 5.0. California Department of Fish and Wildlife, Habitat Planning and Conservation Branch. Accessed January 2018. Electronic Database.

California Natural Diversity Database (CNDDB). 2024. Rare Find 5.0. California Department of Fish and Wildlife, Habitat Planning and Conservation Branch. Accessed November 2024. Electronic Database.

California Public Utilities Commission (CPUC). 2015. 2010–2012 Energy Efficiency Annual Progress Evaluation Report. Accessed September 2019. Available at: https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/EE_and_Energy_Savings_Assist/EEReport_Main_Book_v008.pdf.

California Public Utilities Commission (CPUC). 2017. California Renewable Portfolio Standard Annual Report – November 2017. Available at: http://www.cpuc.ca.gov/uploadedfiles/cpuc_website/content/utilities_and_industries/energy/reports_and_white_papers/nov%202017%20-%20rps%20annual%20report.pdf.

California Regional Water Quality Control Board – Central Valley Region (CVRWQCB). 2018. The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin. Fifth Edition. Revised May 2018 (with Approved Amendments). Available at: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf.

California State Parks. 2009. Complete Findings Survey of Public Opinions and Attitudes on Outdoor Recreation in California 2009. Available at: http://www.parks.ca.gov/pages/795/files/2009%20spoa%20complete%20findings%209_28_09.pdf. Accessed October 29, 2013.

California Transportation Commission. 2017. 2017 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations. Available at: http://www.dot.ca.gov/hq/tpp/offices/orip/rtp/docs/2017RTPGuidelinesforMPOs.pdf. Accessed April 22, 2019.

Candelaria, Christina. 2025. Adult Winter-run Chinook Salmon seen in McCloud River for First Time in almost 100 Years. July 22. Electronic document, https://krcrtv.com/news/local/adult-winter-run-chinook-salmon-seen-in-mccloud-river-for-first-time-in-almost-100-years.

Cassidy, Julie. 2005. National Register of Historic Places Nomination for CA-SIS-1353 /05-14-61-253, Coonrod Flat. Draft on file Shasta-Trinity National Forest, Redding, California.

Central Valley Regional Water Quality Control Board (CVRWQCB). 2019. Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region - Fifth Edition. Sacramento River Basin and the San Joaquin River Basin. Revised February 2019 (With Approved Amendments). Available At: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201902.pdf

County of Shasta. 2004. *[See full entry under: Shasta County Planning Division (County of Shasta). 2004.]*

Dadigan, Marc. 2011. Winnemem Wintu Tribe Travels Across the Pacific to Recover Lost Salmon Species. August 31. Electronic document, https://www.huffpost.com/entry/winnimem-wintu-tribe-salmon-recovery_n_943921.

Daniels, R.A., and P.B. Moyle. 1978. Biology, Distribution, and Status of Cottus asperrimus in the Pit River drainage, northeastern California. Copeia. Vol. 1978, No. 4 (December 28, 1978), pp. 673–679.

Davis-King & Associates (DKA). 2012. Winnemem Wintu interview and GIS data. On file, Davis King & Associates, Standard, California.

Davis-King, Shelly. 2013. *The Winnemem Wintu Tribe: An Ethnographic Summary for the Upper Sacramento River, McCloud River, and Pit River Integrated Regional Water Management Plan.* Submitted to The River Exchange, Dunsmuir, California.

Davis-King, Shelly. 2014. *Ethnographic and Historic Information about Samwel (sic Sawal) Cave, Shasta County, California*. Submitted to USDA Forest Service, Shasta-Trinity National Forest, Redding, California.

Davis-King, Shelly. 2021. Memorandum of 2 July to Mike Newland regarding background language, random information, and some methods. On file, ESA, Sacramento, and Winnemem Wintu THPO Office, Shasta, California.

Du Bois, Cora A. 1935. *Wintu Ethnography*. University of California Publications in American Archaeology and Ethnology 36:1–148. University of California, Berkeley.

Du Bois, Cora A., and D. Demetracopoulou 1931. *Wintu Myths*. University of California Publications in American Archaeology and Ethnology 36:1–148. University of California, Berkeley.

Du Bois, Cora A. 1939. *The 1870 Ghost Dance*. University of California Anthropological Records 3(1). Berkeley.

Dupras, D. 1997. Open File Report 97-03 Mineral Land Classification of Alluvial Sand and Gravel, Crushed Stone, Volcanic Cinders, Limestone, and Diatomite within Shasta County, California.

Dusek Jennings, E., and A.N. Hendrix. 2020. Spawn Timing of Winter-Run Chinook Salmon in the Upper Sacramento River. San Francisco Estuary and Watershed Science, 18(2). http://dx.doi.org/10.15447/sfews.2020v18iss2art5. Available at: https://escholarship.org/uc/item/00c1r2mz.

Eggers, Steve (Thomas R. Payne & Associates). 2009. Iron Canyon Creek Instream Flow Study (FA-S1), Hydraulic Simulation Files. Technical Memorandum 40. June 9.

Farnham. April 2007. “Their Sleep is to Be Desecrated:” The Central Valley project and the Wintu People of Northern California, 1938-1943. *Ethnic Studies Review* 30:135–165.

Federal Energy Regulatory Commission (FERC). 2009. South Feather Power Project FERC Project No. 2088-068, California. Final Environmental Impact Statement. FERC/EIS-0225F. Office of Energy Projects. Washington, D.C. June.

Federal Energy Regulatory Commission (FERC). 2011. Final Environmental Impact Statement for Hydropower License, McCloud-Pit Hydroelectric Project, FERC Project No. 2106, California. February 2011.

Federal Highway Administration. 2012. National forest scenic byways. Available at: http://byways.org/explore/byways/other/usfs. Accessed May 1, 2012.

Friends of the Pleistocene (FOP). 1995. Pacific Cell field trip guidebook: Quaternary geology along the boundary between the Modoc Plateau, southern Cascade Mountains, and northern Sierra Nevada. Friends of the Pleistocene.

Goodsell, Joanne. 2017. Department of Parks and Recreation Primary Record for the Winnemem Wintu Cultural Landscape. On file, Winnemem Wintu THPO office, Mount Shasta, California.

Guffanti, M., and C.S. Weaver. 1988. Distribution of late Cenozoic volcanic vents in the Cascade Range: volcanic arc segmentation and regional tectonic considerations. Journal of Geophysical Research 93(B6):6,513–6,529.

Guildford-Kardell, Margaret. 1994. Historical research data, documentation, maps and/or photographs on 41 sites/features with the McCloud Ranger District or the Shasta-Trinity National Forest. On file, Mount Shasta Ranger District, Shasta Trinity National Forest, Mount Shasta City, California.

Harrington, John Peabody n.d. Field notes on file. Shasta-Trinity National Forest, Redding, California.

Hedgpeth, Joel W. 1941. *Livingston Stone and Fish Culture in California*. California Fish and Game 27(8):1–22.

Henn, Winfield. 1993a. National Register of Historic Places Nomination for CA-SIS-1406/H/05-14-59-362, Panther Meadow. Draft on file, Shasta-Trinity National Forest, Redding, California.

Henn, Winfield. 1993b. National Register of Historic Places Multiple Property Nomination for Mount Shasta in Native American Culture and History. Draft on file, Shasta-Trinity National Forest, Redding, California.

Higinbotham, L. 1987. Montgomery Creek Formation, Klamath Mountains, Shasta County, California. California Geology 40(6): 130–138.

Hoveman, Alice R. 2002. *Journey to Justice. The Wintu People and the Salmon*. Turtle Bay Exploration Park, Redding, California.

Hunter, M. 1992. Hydropower flow fluctuation and salmonids: a review of the biological effects, mechanical causes, and options for mitigation. State of Washington Department of Fisheries.

Indian Cultural Organization (ICO). 2024. 2023 Wrap Up: Great Steps Forward to Bring the Nur Home. ICO, Winnemem Wintu tribal nonprofit since 1983, Redding, CA.

Irwin, W.P. 1994. Geologic map of the Klamath Mountains, California, and Oregon. United States Geological Survey, map I-2148, scale 1:500,000.

Jennings, C.W. 1994. Fault activity map of California and adjacent areas. California Division of Mines and Geology, Geologic Data Map No. 6.

Jones and Stokes Associates, Inc. 1988. McCloud River Wild and Scenic River Study Report: Final Study Report. Prepared for The Resources Agency, State of California. Sacramento, California.

Kasler, Dale, and Ryan Sabalow. 2019. Trump administration threatens jail time for California officials over river project. The Sacramento Bee. Retrieved from https://www.sacbee.com. September 17.

King, Thomas. 2003. *Places that Count: Traditional Cultural Properties in Cultural Resource Management.* Altamira Press, Walnut Creek, California.

Martin, B.T., A. Pike, S.N. John, N. Hamda, J. Roberts, S.T. Lindley, and E.M. Danner. 2017. Phenomenological vs. biophysical models of thermal stress in aquatic eggs. Ecology Letters, 20: 50–59. https://doi.org/10.1111/ele.12705.

Masson, Marcelle. 1998. *A Bag of Bones. Legends of the Wintu Indians of Northern California.* Naturegraph Publishers, Happy Camp, California.

McMillen, Inc., and McBain Associates. 2024. McCloud Sediment and Turbidity Study: Feasibility Report (Rev. No. 1). Resources Law Group.

McTavish, Anne Kathryn. 2010. The Role of Critical Cartography in Environmental Justice: Land-use Conflict at Shasta Dam, California. Master of Arts thesis, Geography. San Francisco State University, San Francisco.

Merriam, C. Hart n.d. Ethnogeographic and ethnographic notes, Wintoon stock. BANC Film 1022, Reels 5, 11, 18. On file at the Bancroft Library, University of California, Berkeley.

Merriam, C. Hart. 1903. July 23, 24. Field notes on visiting McCloud. BANC Film 1022, Reels 5, 11, 18. On file at the Bancroft Library, University of California, Berkeley.

Moving Image Productions 2013. *Dancing Salmon Home. A California Tribe Reunites with Salmon Relatives in New Zealand.* Moving Image Productions, Eugene, Oregon.

Moyle, P.B. 2002. Inland Fishes of California. Revised and Expanded. Berkeley: University of California Press.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. Fish species of special concern in California. Second edition. University of California, Davis. Prepared for the Resources Agency, Department of Fish and Game, Inland Fisheries Division. June.

Nafis, Gary. 2018. A Guide to the Amphibians and Reptiles of California [web application]. Available at: http://www.californiaherps.com. Accessed 2018.

National Marine Fisheries Service (NMFS). 2009a. Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. National Marine Fisheries Service, Southwest Region. June 4, 2009.

National Marine Fisheries Service (NMFS). 2009b. Endangered Species Act Section 7(a)(2) Programmatic Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project. [Note: The source document assigns a 2009 date to this entry but the document date reads December 6, 2024. This may be intended as the NMFS 2024a entry — see below. Please verify.]

National Marine Fisheries Service (NMFS). 2010. Federal Power Act Preliminary Prescriptions, Terms, Conditions, Recommendations, and Comments; Motion to Intervene; and Management Goals and Objectives for the McCloud-Pit Hydroelectric Project, Federal Energy Regulatory Commission Project No. 2106, McCloud and Pit Rivers, California. January 29. FERC Accession #: 20100129-5007.

National Marine Fisheries Service (NMFS). 2011. Endangered Species Act Section 7 Consultation Biological Opinion for United States Environmental Protection Agency Registration of Pesticides 2, 4-D, Triclopyr Bee, Diuron, Linuron, Captan, and Chlorothalonil.

National Marine Fisheries Service (NMFS). 2019. Endangered Species Act Section 7(a)(2) Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project. NOAA Fisheries, West Coast Region. October 21, 2019.

National Marine Fisheries Service (NMFS). 2022. Partners Return Endangered Winter-Run Chinook Eggs to Their Original Habitat in Response to Drought. Department of Commerce, pp. 1–2.

National Marine Fisheries Service (NMFS). 2023a. Final Environmental Assessment for the Designation and Authorization for Release of Nonessential Experimental Populations of Sacramento River Winter-Run and Central Valley Spring-Run Chinook Salmon in the McCloud and Upper Sacramento Rivers above Shasta Dam under Endangered Species Act Section 10(j) and 4(d). NOAA Fisheries, WCR, Sacramento, CA. Final Rule.

National Marine Fisheries Service (NMFS). 2023b. Recovering Threatened and Endangered Species FY 2021–2022 Report to Congress. Department of Commerce, pp. 1–80.

National Marine Fisheries Service (NMFS). 2024a. Endangered Species Act Section 7(a)(2) Programmatic Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project. NOAA Fisheries, West Coast Region. December 6, 2024.

National Marine Fisheries Service (NMFS) 2024b. Comments on the Subsequent Environmental Impact Report for the McCloud–Pit Hydroelectric Project (FERC Project No. P-2106). Letter to the State Water Resources Control Board, May 1, 2024. National Marine Fisheries Service, Sacramento, CA.

National Marine Fisheries Service (NMFS). 2024c. 2024 5-Year Review: Summary & Evaluation of Sacramento River Winter-Run Chinook Salmon. NOAA Fisheries, West Coast Region. Available at: https://repository.library.noaa.gov/view/noaa/60883

National Oceanic and Atmospheric Administration (NOAA) Fisheries 2023a. The Original Salmon Stewards. How the Winnemem Wintu Tribe Helped Return Endangered Chinook Salmon to the Homeland They Share. Electronic document, https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/original-salmon-stewards.

National Oceanic and Atmospheric Administration (NOAA) Fisheries 2023b. NMFS-2023-WCRO-047 Agreement and Co-Stewardship Framework for Reintroduction of Anadromous Salmonids in the Tribal Cultural Landscape of the Winnemem Wintu Tribe along the McCloud River Watershed.

National Oceanic and Atmospheric Administration (NOAA) Fisheries 2024. Letter from NOAA to FERC re FERC P-2106; the U.S. Department of Commerce's, NOAA Fisheries, West Coast Region's Technical Assistance for the Federal Energy Regulatory Commission's Relicensing of the McCloud-Pit Hydroelectric Project (P-2106). Regarding Updates for the Bureau of Reclamation's Shasta Dam Fish Passage Program into the Lower McCloud River. May 1, 2024. On file, FERC, Washington D.C.

National Park Service (NPS) 1997. *How to Apply the National Register Criteria for Evaluation*. Bulletin 15. U.S. Department of the Interior, National Park Service, Washington, D.C.

Natural Resources Conservation Service (NRCS). 2012. Web Soil Survey, United States Department of Agriculture. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed: August 2018.

Nevares, Steve (PG&E), and Alison MacDougall (The Louis Berger Group). 2009. Traditional Cultural Properties (CR-S2). Technical Memorandum (TM-52). Updated July.

Nevares, Steve (PG&E), and Jay Stallman (Stillwater Sciences). 2010. Investigation of Star City Creek Sediment Deposits. Technical Memorandum 76 (TM-76). October 28.

Nevares, Steve (PG&E), and Jot Splenda (The Louis Berger Group). 2008. Road Conditions Inventory. RL-S6, Technical Memorandum 55. July 10.

Nevares, Steve (PG&E), and Jot Splenda (The Louis Berger Group). 2009a. Traffic Study and Road Condition Inventory. RL-S6, Technical Memorandum 22. January 20.

Nevares, Steve (PG&E), and Jot Splenda (The Louis Berger Group). 2009b. Road Conditions Inventory. RL-S6, Technical Memorandum 55. July 10.

Nevares, Steve (PG&E), and Keith Marine (North State Resources). 2009. Characterization of Fish Populations in McCloud-Pit Hydroelectric Project Reservoirs. FA-S3, Technical Memorandum 15. January 12.

Nevares, Steve (PG&E), and Len Lindstrand III (North State Resources). 2008. Results of Shasta Salamander Surveys in the Project Area. FA-S2, Technical Memorandum 49. October 23.

Nevares, Steve (PG&E), and Nicole Jurjavcic (Stillwater Sciences). 2009. Data Summary for Special Status and Special-Interest Plant, Lichen, and Fungi Species in the Study Area. BR-S2, Technical Memorandum 12. July 10.

Nevares, Steve (PG&E), and Russ Liebig (Stillwater Sciences). 2009. Results of 2007–2009 Survey of Fish Populations in Project-Affected Stream Reaches. FA-S3, Technical Memorandum 18. November 16.

Nevares, Steve (PG&E), Darren Trawick, and Christine Champe (Stillwater Sciences). 2009. Assessment of Pacific Fisher Habitat in the Project Area. WL-S4, Technical Memorandum 62. February 3.

Nevares, Steve (PG&E), Doug Whittaker, and Bo Shelby (Confluence Research and Consulting). 2009. Lower McCloud River Report on Flows and Fishing Conditions (A Component of Recreation Flow Assessment, RL-S3). RL-S3, Technical Memorandum 58. February 12.

Nevares, Steve (PG&E), Holly Shepley, and Christine Champe (Stillwater Sciences). 2009. Survey of Special Status Amphibian and Aquatic Reptiles Near Project Reservoirs and Project-Affected Stream Reaches. FA-S2, Technical Memorandum 09. February 11.

Nevares, Steve (PG&E), Jay Stallman, and Ronna Bowers (Stillwater Sciences). 2009. Inventory and Assessment of Erosion and Sediment from Project Construction, Operation, and Maintenance (GS-S1). Technical Memorandum 67. January 29.

Nevares, Steve (PG&E), Jot Splenda, and Lucy Littlejohn (The Louis Berger Group). 2008. Data Summary for Developed and Dispersed Recreation Inventory (RL-S2). Updated October 2008. Technical Memorandum 16 (TM-16).

Nevares, Steve (PG&E), S. Nevares, and J. Stallman. 2009. Assessment of Channel Morphology and Fluvial Geomorphic Processes in the Lower McCloud River (GS-S2). Technical Memorandum 68 (TM-68). January 30.

Nevares, Steve (PG&E), Tami Cosio, and Christine Champe (Stillwater Sciences). 2008a. Results of 2007–2008 Peregrine Falcon Habitat Use near Project Reservoirs and Project-Affected Stream Reaches. WL-S1, Technical Memorandum 60. December 9.

Nevares, Steve (PG&E), Tami Cosio, and Christine Champe (Stillwater Sciences). 2008b. Results of 2007–2008 Bald Eagle Habitat Use near Project Reservoirs and Project-Affected Stream Reaches. WL-S1, Technical Memorandum 61. December 10.

Nilsson, Elena, William Hildebrandt, and Sharon A. Waechter. 2008. Native American Tribal Coordination, Shasta Lake Water Resources Investigation, California. Far Western Anthropological Research Group, Inc., Davis, California.

Norris, Robert M., and Robert W. Webb. 1990. Geology of California. New York: John Wiley & Sons.

Pacific Gas and Electric Company (PG&E) 2009. *McCloud-Pit Hydroelectric Project, FERC Project No. 2106, Study Report CR-S1, Archaeological and Historic-era Properties (Privileged).* PG&E relicensing application, on file FERC, Washington D.C.

Pacific Gas and Electric Company (PG&E). 2008. Aesthetic Resources Assessment (AR-S1). Technical Memorandum (TM-57) – McCloud-Pit Project, FERC Project No. 2106. Pacific Gas and Electric Company. San Francisco, California.

Pacific Gas and Electric Company (PG&E). 2009. McCloud-Pit Hydroelectric Project FERC Project No. 2106 Application for New License. July, updated September.

Pacific Gas and Electric Company (PG&E). 2009b. Lower McCloud River Water Temperature Modeling (TM-38). McCloud-Pit Project, FERC Project No. 2106. Retrieved from http://www.mccloud-pitrelicensing.com.

Pacific Gas and Electric Company (PG&E). 2010. McCloud-Pit Hydroelectric Project FERC Project No. 2106, PRIVILEGED HPMP Volume I. October 26, 2010.

Pacific Gas and Electric Company (PG&E). 2019. Amended 2019 Wildfire Safety Plan. February 6, 2019.

Pedersen, Dirk, and Wayne Swaney (Stillwater Sciences). 2011. Lower McCloud River 1-D PHABSIM 2011 Supplemental Analysis. FA-S9, Technical Memorandum 77. July 29.

Pedersen, Dirk, Wayne Swaney, Scott Wilcox (Stillwater Sciences), John Klobas, and Gene Geary (PG&E). 2012a. Lower McCloud River Chinook Salmon and Steelhead PHABSIM Analysis. FA-S9, Technical Memorandum 81. January 23.

Pedersen, Dirk, Scott Wilcox (Stillwater Sciences), Gene Geary, and John Klobas (PG&E). 2012b. Lower McCloud River Salmon and Steelhead Spawning Gravel Mapping. FA-S9, Technical Memorandum 80. January 20.

Preston, Michael "Pom," and Natasha Deganello Giraudie 2020. *One Word Sawalmem*. Micro-Documentaries, LLC.

Rossi, Gabriel J., J. Ryan Bellmore, Jonathan B. Armstrong, Carson Jeffres, Sean M. Naman, Stephanie M. Carlson, Theodore E. Grantham, Matthew J. Kaylor, Seth White, Jacob Katz, and Mary E. Power. 2024. The foodscape–(re)connecting salmon to the productive capacity of their watersheds. California Water Blog, UC Davis Center for Watershed Sciences. Posted October 6, 2024. Electronic document, https://californiawaterblog.com/2024/10/06/the-foodscape-re-connecting-salmon-to-the-productive-capacity-of-their-watersheds/.

Sacramento Valley Air Quality Engineering and Enforcement Professionals (SVAQEEP). 2015. Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan. Available at: https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/aq-docs/2015_triennial_air_quality_attainment_plan.pdf. Accessed March 2019.

Sawyer, T.L. 1998. Potential seismic sources, Pit No. 4 Dam, Shasta County, California. Report to Pacific Gas and Electric Company, 26 pp., plus figures, table, and appendix.

Seamans, Alice L. 1947. Last Dance of the Wintus. *Covered Wagon* Spring:14–16.

Shasta County Air Quality Management District (AQMD). 2012. Draft Regional Climate Action Plan. Available at: https://www.co.shasta.ca.us/index/drm_index/aq_index/programs/RCAP/Draft_RCAP.aspx. Accessed August 2018.

Shasta County Air Quality Management District (AQMD). 2018. Shasta County AQMD List of Current Rules. Available at: https://ww3.arb.ca.gov/drdb/sha/cur.htm. Accessed October 2019.

Shasta County Planning Division (County of Shasta). 2004. Shasta County General Plan. As amended through September 2004. Available at: https://www.co.shasta.ca.us/index/drm_index/planning_index/plng_general_plan.aspx. Accessed August 2018.

Shuford, W.D., and T. Gardali, editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Sisk, Caleen n.d. A Little Justice for Wintu Indians. On file, Davis King & Associates, Standard, California.

Sisk, Caleen, and Marc Dadigan. 2024. Listening to Lendada Nur (Ancient, Wise, All-Knowing Salmon): A Winnemem Wintu History of the Baird Station Salmon Hatchery and the Formation of Fisheries Science. *American Indian Culture and Research Journal* (July 9).

Sisk, Caleen. 2009. Notes from interviews of February 12-16 at the village of *tullmyalii*, and in certain locales near and upon the McCloud River. On file, Davis-King & Associates, Standard, California.

Sisk, Caleen. 2018. Presentation to the Geography of Hope: Finding Resilience in Nature in Perilous Times Conference, Point Reyes Station, California. March 17.

Siskiyou County. 1973. Conservation Element. Siskiyou County General Plan. Siskiyou County Community Development Department, Yreka, California.

Spring Rivers Ecological Services. 2001. Geology in the vicinity of Pacific Gas and Electric Company's Pit 3, 4, and 5 Hydroelectric Project (FERC No. 233), Shasta County, California. Report prepared for Pacific Gas and Electric Company. 42 pp. plus figures and tables.

State Water Resources Control Board (SWRCB). 2019. PG&E McCloud-Pit Hydroelectric Project - Draft Initial Study / Negative Declaration. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/mccloud_ferc2106/20190502_mccloud_pit_draft_isnd.pdf

Stillwater Sciences. 2008. Water Temperature Monitoring Program Report for 2007 McCloud-Pit Project. Prepared for Pacific Gas and Electric Company, Technical and Ecological Services. WR-S3, Technical Memorandum 28. May 15.

Stone, Livingston. 1897. The Artificial Propagation of Salmon on the Pacific Coast of the United States, with Notes on the Natural History of the Quinnat Salmon. *Bulletin of the U.S. Fish Commission for 1896* 16:203–235.

Sullivan, B.L., C.L. Wood, M.J. Iliff, R.E. Bonney, D. Fink, and S. Kelling. 2009. eBird: a citizen-based bird observation network in the biological sciences. Biological Conservation 142: 2282–2292.

Swaney, Wayne, Scott Wilcox, Dirk Pedersen (Stillwater Sciences), and Gene Geary (PG&E). 2011. Lower McCloud River Habitat Suitability Criteria Development for Chinook Salmon and Steelhead. FA-S9, Technical Memorandum 79. November 8.

Theodoratus Cultural Research. 1981. *Native American Cultural Overview. Shasta-Trinity National Forest*. USDA Forest Service, Shasta-Trinity National Forest, Redding.

United States Energy Information Administration (USEIA). 2019. Rankings: Total Energy Consumed Per Capita, 2016. Available at: https://www.eia.gov/state/rankings/?sid=US.

United States Environmental Protection Agency (USEPA). 2018. Letter Approving California 2014–2016 CWA Section 303(d) List of Impaired Waters. Available at: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/impaired_waters_list/2014_int_rpt_dev/2014_2016_int_rpt/2018_0406_usepa_appr_ltr_final.pdf. Accessed August 2018.

United States Fish and Wildlife Service (USFWS). 2003. Formal Endangered Species Consultation on the Pacific Gas and Electric Company Transmission Separation Project, located in the Plumas, Sequoia, and Sierra National Forests within Butte, Plumas, Madera and Fresno Counties; in the Redding, Folsom, and Bakersfield Districts within Madera, Fresno, Amador, Calaveras, Tuolumne, Nevada, Placer, Butte, Yuba, Shasta and Tehama Counties, and Various Other Jurisdictions, California. United States Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office. Sacramento, California.

United States Fish and Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines. May 2007.

United States Fish and Wildlife Service (USFWS). 2008. USFWS Biological Opinion on Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP). California and Nevada Region, 410 pp.

United States Fish and Wildlife Service (USFWS). 2010. Bull Trout. Pacific Region. Available at: http://www.fws.gov/pacific/bulltrout/. Accessed June 6, 2013.

United States Fish and Wildlife Service (USFWS). 2011. Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina). United States Fish and Wildlife Service, Portland, Oregon. Available at: https://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Recovery/Library/Documents/RevisedNSORecPlan2011.pdf.

United States Fish and Wildlife Service (USFWS). 2014. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to Remove the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife. Federal Register Vol. 79, No. 180, 55874–55917. September 17, 2014. Available at: https://www.govinfo.gov/content/pkg/FR-2014-09-17/pdf/2014-21585.pdf.

United States Fish and Wildlife Service (USFWS). 2017. Species List, Information for Planning and Conservation (IPaC). Electronic Database. Accessed October 2017.

United States Fish and Wildlife Service (USFWS). 2018a. Franklin's Bumble Bee (Bombus franklini), Species Status Assessment. Final Report (Version 1). June 25, 2018.

United States Fish and Wildlife Service (USFWS). 2018b. Species Status Assessment for the Sierra Nevada Distinct Population Segment of the Sierra Nevada Red Fox. February 2018. U.S. Fish and Wildlife Service Region 8, Sacramento, CA.

United States Fish and Wildlife Service (USFWS). 2019. Biological Opinion on Long-term Operation of the Central Valley Project and the State Water Project.

United States Fish and Wildlife Service (USFWS). 2021. Revised Designation of Critical Habitat for the Northern Spotted Owl. Available at: https://www.fws.gov/species-publication-action/revised-designation-critical-habitat-northern-spotted-owl-2.

United States Fish and Wildlife Service (USFWS). 2023. Threatened Species Status with Section 4(d) Rule for North American Wolverine. Final Rule. Federal Register Vol. 88, No. 229, Pages 83726–83772. November 30, 2023.

United States Fish and Wildlife Service (USFWS). 2024. Species List, Information for Planning and Conservation (IPaC). Electronic Database. Accessed November 2024.

United States Forest Service (USFS). 1987. Shasta-Trinity National Forest visual quality objectives. United States Department of Agriculture, Trinity National Forest, California, Regional Office. San Francisco, California.

United States Forest Service (USFS). 1995. Shasta-Trinity National Forest Land and Resource Management Plan. U.S. Department of Agriculture, Trinity National Forest, California, Regional Office. San Francisco, California.

United States Forest Service (USFS). 1998. Redband Trout Conservation Agreement. Shasta-Trinity National Forest.

United States Forest Service (USFS). 2000. Water Quality Management for Forest System Lands in California. Available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5362512.pdf. Accessed August 2018.

United States Forest Service (USFS). 2008. Land suitability class geodatabase data. File name: LandSuitabilityClassSHF08_1. United States Forest Service, Region 5, Remote Sensing Lab. Available at: https://www.fs.usda.gov/detail/r5/landmanagement/gis/?cid=fsbdev3_048226.

United States Forest Service (USFS). 2010a. Forest Service Final Section 4(e) Conditions, Section 10(a) Recommendation and Comments, McCloud-Pit Hydroelectric Project, FERC No. 2106. November 29, 2010.

United States Forest Service (USFS). 2010b. Enclosure 3: USFS Project Implementation Guide and Draft Implementation Plans In Connection with the McCloud-Pit Hydroelectric Project, FERC No. 2106 Pacific Gas & Electric Company.

United States Forest Service (USFS). 2011. Lower McCloud Watershed Analysis. United States Forest Service, Shasta-Trinity National Forest, Shasta-McCloud Management Unit.

United States Forest Service (USFS). 2013a. Annual Visitation Estimate. Available at: https://apps.fs.usda.gov/nvum/results/A05014.aspx/FY2013. Accessed October 2018.

United States Forest Service (USFS). 2013b. Regional Forester's List of Sensitive Plant and Animal Species for Region 5.

United States Forest Service (USFS). 2018. Recreation.gov website. Available at: https://www.recreation.gov/camping/gateways/1073. Accessed October 2018.

United States Geological Service (USGS). Seismic Hazards Mapping. Available at: https://earthquake.usgs.gov/hazards/hazmaps/. Accessed August 2018.

United States Geological Survey (USGS). 2005. Hydrologic Units of the United States. Available at: https://water.usgs.gov/themes/hydrologic-units/

United States, Bureau of Reclamation (BOR). 2017. Letter re Continuing Consultation Pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the Shasta Dam Fish Passage Evaluation (SDFPE) Pilot Program, Shasta and Siskiyou counties, California (15-NCAO-173) from Anastasia T. Leigh to Caleen Sisk, dated January 11.

United States, Bureau of Reclamation (BOR). 2019. *Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley and State Water Projects, BOR, California Mid-Pacific Region, Final Biological Assessment*. U.S. Department of the Interior.

United States, Bureau of Reclamation (BOR). 2023. *Long-Term Operation—Biological Assessment. State and Federal Cooperating Agency Draft LTO Alternative*. Department of the Interior.

Winnemem Wintu Tribe. 2017. Winnemem Wintu Salmon Restoration Plan McCloud River. Electronic document, https://cawaterlibrary.net/wp-content/uploads/2017/05/shasta_winnemem.pdf.

Winnemem Wintu Tribe. 2021a. Caleen Sisk, Tribal Chief, Mark Miyoshi, Tribal Historic Preservation Officer, and Luisa Navejas, Winnemem Wintu Tribe OHP, Consultation with California Department of Water Resources.

Winnemem Wintu Tribe. 2021b. Caleen Sisk, Tribal Chief, Mark Miyoshi, Tribal Historic Preservation Officer, and Luisa Navejas, Winnemem Wintu Tribe OHP, Consultation with California Department of Water Resources, March 9.

Winnemem Wintu Tribe. 2021c. Caleen Sisk, Tribal Chief, Mark Miyoshi, Tribal Historic Preservation Officer, and Luisa Navejas, Winnemem Wintu Tribe OHP, Consultation with California Department of Water Resources, March 16.

Winnemem Wintu Tribe. 2021d. Caleen Sisk, Tribal Chief, Mark Miyoshi, Tribal Historic Preservation Officer, and Luisa Navejas, Winnemem Wintu Tribe OHP, Consultation with California Department of Water Resources, March 23.

Winnemem Wintu Tribe. 2021e. Caleen Sisk, Tribal Chief, Mark Miyoshi, Tribal Historic Preservation Officer, and Luisa Navejas, Winnemem Wintu Tribe OHP, Consultation with California Department of Water Resources, April 13.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White (editors). 1988. California's Wildlife, Volume I: Amphibians and Reptiles. State of California, The Resources Agency, Department of Fish and Game. Sacramento, California. 272 pp.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White (editors). 1990a. California's Wildlife, Volume III: Mammals. State of California, The Resources Agency, Department of Fish and Game. Sacramento, California. 407 pp.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White (editors). 1990b. California's Wildlife, Volume II: Birds. State of California, The Resources Agency, Department of Fish and Game. Sacramento, California.

APPENDICES

All appendices are available on the State Water Board's McCloud-Pit Hydroelectric Project webpage at: https://waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/mccloudpit_ferc2106.html.